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SOUTHERN THURINGIA: THE UPPER WERRAAND ITZ REGION AND THE GRABFELD

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10. Themar -- Vachdorf -- Marisfeld Trough -- Rohr -- Grimmenthal -- Meiningen

The erosional landscape near the Nadeloehr, Leutersdorf, and Vachdorf; via the post-basaltic plain and the Marisfeld trough to Rohr; via Grimmenthal, Dreissigacker to Meiningen.

From Themar, on the road to Henfstaedt in Recent deposits which still today are partially damp and which are covered with reed-grass meadows and strongly anthropogenetically-influenced, inextensive flood-plain woods in the form of an Alnetum ("Erlicht"), one can recognize several old river courses. The Osterburg castle with a lookout tower rises on the steep spur of the Hain. The Wellenkalk strata of this mountain trend toward the south-east, so that the Wellenkalk is situated on the high Roetsockel near Themar, extending down between Henfstaedt and Vachdorf under the level of the Werra. Thus can be explained the relatively great width of the valley between Themar and Henfstaedt; whereas the Werra Valley becomes strikingly narrow down towards Henfstaedt. Situated at the beginning of the vally constriction in the Wellenkalk, close to the Werra, on the lowermost Pleistocene terrace, is Henfstaedt, a very old irregularly-laid out village which has perhaps remained without a nucleus since the initial settlement period. The village possesses old Hannebergian feudal estates

and an old church whose steeple is supported by a saddle roof having a beautiful Renaissance form. Its environs possess fertile alluvial and diluvium soils. The valley region in the immediate proximity is quite informative in many aspects. We enjoy an instructive view from the Middle Pleistocene terrace west of the signalman's hut. The glorious, amphitheaterlike concave bank is the Stickelleite ("stickel" = "steil" [steep], i. e., "steile Leite" [steep slope]), the work of Pleistocene and old Holocene fluvial erosion. From the south, a glacial boss projects closely to the concave bank -- a boss which the Werra originally flowed around (cut-off meander spur). In a phase of strong accumulation (aggradation) of the older Holocene, the valley bottom was superimposed by a gravel covering. Later, the Werra "gnawed out" the spur (the "Nadeloeher"); finally, in the construction of the Werra line, artificial openings had to be made for the river, the rail line, and the highway, whereby the beauty of this cut-off meander spur was detrimentally affected (cf. Figure 27). The botanical cover of the environs is likewise informative. In full primitiveness, steppe or rocky heaths cover the steep, sunny Wellenkalk places on the steep slopes, rocky spurs, and Pleistocene terraces near the signalman's hut. Wedge-shaped, equally-primitive heather woods protrude pioneerlike into the notches of the concave bank; such woods also cover the Hain with the Osterburg castle. The Pleistocene terraces and the old Holocene terraces have been successfully used for farming. For those who are not susceptible to dizziness, the climbing of the steep wall of the Stickelleite is a rewarding experience. From the top of the latter one has an open view of the entire Wellenkalk formation with its characteristic harder rock benches, the sole oolitic bench, the two Terebratula beds, and the aphrite level toward the edge of the plateau. Through

the petrographic contrasts, the morphologic forces, and the micro-climate, a rich mosaic habitat has been created here in which quite characteristic plant communities have taken root in accordance with the laws of nature: cryptogamic rocky "pioneers" on the harder stone benches, the asphodel-rich blue-grass slope (*Anthericum ramosum*-*Sesleria coerules* community) of the pebbly slope which warms to 50° C or more with Pontian and Mediterranean varieties, stonecrop and *Melica ciliata* stands on ledges. In the notches of the concave bank the plant stand in the multivariety heather woods has attained a higher stage of plant-community life (cf. Kaiser, 1926). The shady northern valley wall of the Wellenkalk is covered by a certain habitat variant of the deciduous mixed forest -- the Wasserleiten Forest (cf. Kaiser, 1926) -- which extends to Leutersdorf and, interruptedly, to Vachdorf on the left bank of the Werra. (In my Landschaftsbiologie: Die Landschaft am Nadeloehr der Werra [Biology of a Landscape: the Landscape on the Nadeloehr of the Werra], 1937, I described this charming erosional region with respect to its geological development, its botany, its zoology, its primitive and prehistorical settlement, the relationship of individual symbioses, the organisms concerned as organs of a higher bios, finally characterizing the biology of the landscape in the form of a totality of research and a natural-science synthesis.) Near signalman's hut No 76 before Leutersdorf we are afforded a good view of the three Pleistocene terraces on the left bank: near the mouth of a V-shaped valley lies the youngest terrace which extends along the river as far as Leutersdorf which is situated on this terrace; there above lies the intermediate terrace upon which the fortified church of Leutersdorf rises; still higher lies the oldest terrace. Leutersdorf (Liudoldsdorf) is remarkable due to its picturesque church which had been the mother church of the entire region long before the ecclesiastical rise to power of

the Vessra cloister. The present church lies on the intermediate terrace in a fortified churchyard; the churchyard has a well-preserved towered gate, and fifteen clerestories are maintained. We enjoy another informative view from the heights of the Leutersdorf-Vachdorf road. What contrast is manifest in the morphology of the valley! There where the undulant limestone extends down to the bottom as, for example, between Henfstaedt and Vachdorf, the valley narrows and assumes a boxlike contour. Rocky heaths cover the steep, sunny Wellenkalk slopes, as on the Krayberg and the Haustein, in the rocky bastion of which the last horn owl of the Werra Valley nested 50 years ago. Water pipes cling to the cooler northern parts, rendering an especially pleasing picture on the Muendel near Vachdorf. On the Krayberg we can make out quite clearly from this point the upwarping of the Wellenkalk strata toward the northwest. At the same time, we recognize a synclinal or downwarp of the Wellenkalk between Vachdorf and Henfstaedt. This downwarp occurred in the Cretaceous-Paleogenic era. Below Vachdorf, the Wellenkalk once again covers a Roetsockel on both sides of the flood plain. Here we see the broad valley bottom with relatively low slopes in the region of the Upper Bunter and the steep slopes of the lower Muschelkalk which projects like major folds in individual sections. Above, on both sides, there is again Wellenkalk on the more clayey feet of the Upper Bunter formation. Here the Werra Valley broadens toward the synclinal valley with the broad meadow. Like major folds, the Wellenkalk projects toward the valley from both sides. Even though cultivation near Leutersdorf is possible only on the narrow valley meadow and on the more spacious Pleistocene terraces, the farmers of Vachdorf nevertheless carry out cultivation on the broad valley meadow and on the heavy, loamy, but mineral-rich soils of the Upper Bunter formation. One of the

oldest and most interesting village settlements is Vachdorf (Fachhedorp = Dorf an dem Fach [village on the ledge], "Wasserwehr"). In the earliest Middle Ages it was a Franconian king's estate, which was presumably erected by Henry I as a protective fortress against the Hungarians. It has a fortified church which developed from a moated castle with a circular wall, a defensive tower, donjons, and numerous clerestories. From the halting place of Vachdorf we first take the road to Marisfeld up to the lime kiln; then we take the footpath which leads to the heights of the Krayberg. Here we find ourselves on one of the most beautiful and spacious rocky heaths (steppe heaths) of the upper Werra Valley. Here also, we find a complex of native plant communities which correspond to the mosaic habitat quite in accordance with the laws of nature: characteristic cryptogamic embedded rocky "pioneer" communities, fragments of moss communities in the joints of the Wellenkalk, lichen and moss heaths on shallow calcareous-loamy residuary soils, physiognomically-remarkable associations on pebbly and gravelly slopes, which throughout the change of seasons shine forth in the wonderful color decoration of Pontian-Mediterranean-Central European plant life.

The rocky heath on the Krayberg in the change of seasons (taken from my Vegetationsmonographie [Monograph on Vegetation]) (Kaiser, 1926, page 244 f.): Taking the lead in blooming is *Carex humilis* (the Pontian dwarf sedge which has here its sole habitat in the upper Werra Valley; late March to mid-April). At about the same time the violet bells of *Anemone Pulsatilla* (pasque) make their appearance (April); when the latter sends up its bloom in late April, the dwarf sedge has long since ceased blooming, and the rocky wall shines forth in the gleaming yellow of *Potentilla*

verna (mid-April to mid-May) in many hundreds of hosts and "pillows"
 in assemblages of the size of a square meter; with it blooms
Euphorbia Cyparissias (late April to mid-May). The first blinding-
 white blossoms of *Anemone silvestris* appear when the *Potentilla*
verna is still in full bloom. In early May they lie like snow-
 flakes on the numerous blooming "Schlehnkrueppeln" which are
 scattered over the mountainside. By Whitsuntide (the end of May)
 the strikingly-large and magnificent blossoms of *Rosa spinosissima*
 have opened, and hundreds and hundreds of blood-red *Geranium*
sanguineum blossoms gradually make their appearance. Starting in
 mid-June, the following bloom in the coarsest skeletal structure
 of the gravelly slopes: *Vincetoxicum officinale*, *Stachys rectus*,
Allium senescens, *Anthemis tinctoria*. Following in June: *Teucrium*
Chamaedrys, *Thalictrum minus*. Now above all the mountain blooms
 everywhere -- particularly on the western side in gleaming white:
 thousands of white stars of *Anthericum ramosum* bloom for weeks at
 a time. When they have ceased blooming, summer is over, but the
 blooming on the beautiful rocky heath will seemingly never end.
Asperula cynanchica still manifests abundant blossoms far into
 autumn. Now above all, however, the charming autumnal aster opens
 its bright blue blossoms, forming a last floral decoration of the
 dying steppe heath, in which decoration there is an intermixture
 of the foliage of the blood-red cornel, crane's bill, and
 "Bilbernellrosenzwerge" in diverse shades of red. Then the steppe
 apparently dies, and there is blooming and fructifying only "under
 cover" when snow and ice cover the fields. *Aloina rigida* blooms
 and fructifies in winter; *Camptothecium lutescens* fructifies at the
 end of winter, at which time *Carex humilis*, taking the lead in
 blooming among the phanerogams, has again opened its blossoms.

On the slope of the Krayberg, above the halting place of Vachdorf, two 20-m-long protective walls have captured the calcareous debris which spills down in streams in the presence of cloudburstlike rains (sheet flood). The forestry administration has painstakingly but sparsely afforested the steep Wellenkalk wall with German and Austrian pines (locust trees on the lowermost parts).

From the Krayberg we enjoy a beautiful view of the Werra Valley with its meandering river and its old settlements of Vachdorf, Belrieth, Minhausen, Grimmenthal, Obermassfeld, and Untermassfeld. In the background, the Rhoe Mountains; up the river, the water conduit on the Muendel near Vachdorf; further on, Leutersdorf with the three clearly-projecting Pleistocene terraces; above the latter, the post-basaltic leveling of the terrain, from which the church tower of Beinerstadt looks out, and the basaltic dike of the Steinerne Kirche which stands out in relief toward the river valley, and which is overtowered by the Kleiner Gleichberg. Opposite the Feldstein, the Steinerne Kirche; in the background, the Thuringian Forest. Present on the leveled-off heights of the Krayberg is a deep post-basaltic channel in which the author has found sporadic Thuringian Forest gravel. It is beheaded on both sides by young erosion valleys: a longitudinal valley and a small lateral valley. On the heights of the leveled area, the Marisfeld road leads through the crinoidal level (mo 1) [for this and following similar abbreviations, see pages 142-147 of original] which is well-exposed and quite brecciated along the way. The valleys on both sides -- the Lang Valley and the Eis Valley -- are wide depressions in an area of soft marl of mm and mo, and constrict into V-shaped valleys in the Schaumkalk.

Dr. Heim discovered a post-basaltic channel between the Hoher Rod, the forested heights to the west before us, and the road. The channel discovered by us and described above can be considered a continuation of the latter.

From the height of the road we enjoy an informative view of the Marisfeld Keuper trough (cf. the profile in Figure 29, which we shall include in our excursion). Before us lies Feldstein; behind the latter, Schmeheim; to the northeast, Oberstadt. The wooded elevation to the east is the Feldstein; that to the northeast, the Gruber Schneeberg. Coursing parallelly to the Hercynian-running Marisfeld Keuper strips between Tachbach and Hasel, past Schmeheim and Grub, is a likewise Hercynian-trending ridge of steeply-ascending Muschelkalk: Kuppe, Sargberg, and Questenberg. To the left is the Grosser Dolmar, up to which the Marisfeld Keuper fault trough (with a similar tectonic structure) continues.

The crinoidal level is recognizable as a cliff near a linden along the way. Then follows mm, the slabs of which crop out on the field path coming from the left. At the declivity of the road there is an outcropping of variegated Keuper marl with marly stones (km) and sandy and clayey lettes of ku. Further on there is a small strip of upper Muschelkalk. The road leads through the Keuper trough (ku, km), the colors of which are easily discernable near the tilled fields. The marl of km is clearly recognizable in its outcropping near a small erosional trough to the left. To the right of the road there is an old alluvial bench with quartzitic and sandstone gravels. Located within the trough, there where the Spring Brook turns westward on the

Hercynian-striking fault, is the large irregularly laid-out village of Marisfeld with rich and extensive tilled fields in the marl of the middle upper Muschelkalk and Keuper, as well as in Recent deposits. Within the village there is the castle of the lords of Marschalk (today a children's home) with a glorious Renaissance portal in the courtyard; close by there are several houses in Hennebergian framework style with beautiful St. Andrew's crosses, e. g., the rectory from the seventeenth century, house No 113, and the inn with two stories. Now over mo 2 to Schmeheim. Shortly before this village, we cross the small cycloide bench, the plates of which are permeated with Terebratula cycloides (kroeteneier) and can be seen lying about. The village lies in the valley constriction, where the Spring Brook coming from the Gruber Schneeberg has "gnawed" into the steeply-rising Triassic strata, where there are several geological formations and fertile tilled soil in so, mm, and mo 2; extensive pasture land in mu; where great wooded areas in sm (in mu in northern areas) come together. We can observe in the village itself the steep projection of the strata in several exposures of Bunter sandstone and Muschelkalk.

Back again to the mo 2 leveling, but this time in the direction of the Griesberg (cf. profile in Figure 30).

From the Griesberg we enjoy an interesting view. The elevation on the other side of the Hasel Valley in the northwest is the "Arme Leite," which manifests in its southwest slope toward Rohr the same tectonic structure as the Marisfeld trough whose northwest continuation it represents. On this side of the synclinal valley of the Hasel, the Wellenkalk plate (steeply sloping toward the northwest) of the Dornberg is situated on the Upper

Bunter formation. The northwest wall represents the parent wall of a great rock-slide complex -- the Rohrer Fels -- whose down-thrown masses cover the Upper Bunter formation at many points. The connecting Muschelkalk plateau between Hasel and Werra -- the Hofteichplatte -- manifests manifold traces of old river-stream action. Thus, to be found between Hetzert (1169, Hezzeriet) and Hoelschberg, northeast of Hofteich, is an area of fine loamy sand, colluvial material of an old stream channel. These sandy sedimentary deposits are covered by a most pebbly heath of *Galluna vulgaris* which contrasts sharply with the surrounding calcareous flora (Kaiser, 1926, page 151). The high-lying area south of the Griesberg on the old leveled-off zone is the Hohes Rod west of the Vachdorf-Marisfeld road. Quite clearly recognizable on both sides are the same ancient channels of which we have already established those east of the way to Marisfeld.

We now halt on the Dillstaedt road, then follow the field way near a fork of the road in the direction of Rohr down to the Hasel. We cross the railroad bridge and come to the railroad station of Rohr. Opposite the latter, on the steep declivity of the road near a cave there is an outcropping of the higher, calcareous-dolomitic strata of the Upper Bunter in the disturbed bedding which dips a bit to the south. The village of Rohr, a very old and stately settlement in which many industrial workers and toiling farmers are domiciled, lies close to the confluence of the Hasel and Schwarza on the edge of a nonrushy bog (old High German "ror" = rush) which has been converted into a fertile meadow land. Here, already in Carolingian times, a cloister existed beside the village church; and existing in Saxonian times was a royal villa in which Henry I, Otto I, and Henry II domiciled for a time. The village church, which is dedicated to St. Michael,

arose on a Germanic place of sacrifice and was a fortified structure with a wall, a circular wall, a rampart section, many halls for the reception of people and livestock in times of distress, and a romantic towered gate. A romantic crypt is to be found under the church tower. The Benedictine nunnery was founded on its present site in the eleventh or twelfth century, plundered in the Peasants' War, then converted into a stately domain. In the wake of the land reform in 1946, it was divided into six new farming estates.

Now let us take a trip to the old pilgrimage village of Grimmenthal. Near the railroad station there is a beautiful exposure in the Upper Bunter with a light syncline of the strata; at the lowermost points red limestones, often with grey small marly beds; at the uppermost points, yellow dolomitic-calcareous deposits. Above the Upper Bunter there is an extensive Pleistocene terrace with Thuringian Forest gravels of the Hasel at the lowermost points and, thereabove, fine loamy sands. Now, over the old three-arch stone bridge to Einhausen (to the houses of the Franconian manor lord Egino), a Franconian village laid out along a single street (the main street, in this case) with old Franconian-style-distributed fields (royal, forest, and farm estates which existed before the separation). In the middle part of the previous century gate-houses still existed at the ends of the street. The interesting fortified church originated from reconstructions of the bower and a belfry, i. e., from a castle fortified with strong circular walls having high towered gates. It is phytogeographically remarkable that the rare *Helleborus foetidus*, an Atlantic-Mediterranean invasion type, penetrates as far as the Immer Valley south of Einhausen. It forms a physiognomically-remarkable phenomenon on the plateau of the Doettberg in the beech forest, and in the heath woods of the Michelberg.

Sociogeographically interesting as a settlement, Obermassfeld-Grimmenthal lies in the valley dale which is here quite spacious at the point where the Hasel, from the north, and the Juechse (strengthened by the Bibra), from the south, flow to the Werra. Here arose two Franconian street-villages: Obermassfeld on the older Holocene on the right bank of the river, and Unter-massfeld on the younger alluvial plain (under the protection of a moated castle) on the left bank of the river. Doubtless the older settlement is Obermassfeld (in 837, Mahesfeld, where the gauges for the measuring of grain stood -- gauges which still are present today in the form of five chiseled grain gauges under the village linden). The village was formerly fortified as was its fortified church. To this village belongs the pilgrimage village of Grimmenthal ("wildes Tal" [wild valley], because of the frequent inundations). Until the second half of the previous century, Obermassfeld was a pure peasant village which had found the roots of its industrial life in the soils of the Upper Bunter, the Muschelkalk, and older and younger alluvial deposits. The structure of this village experienced a complete alteration with the building of the Werra rail line (1859) and the Ritschenhausen-Neudietendorf line (1884). The Grimmenthal village part became an important railroad junction of two diagonal rail lines: Lichtenfels-Meiningen-Eisenach and Berlin-Erfurt-Wuerzburg-Stuttgart. The population rose from 225 in the year 1836 to 1,218 in the year 1949, i. e., a more than fivefold increase. None of the surrounding 18 villages has attained such an increase and density of population. Due to the building of ways, streets, and railroad installations, the village fields lost 5% of their acreage. Present today are only one larger leased enterprise (the Kreis-owned hospital estate), nine enterprises of an extent of from 10 to 20 ha, 53 enterprises of an extent of from 0.5 to 5 ha, and 178 enterprises of an extent of less than 0.5 ha.

The population of today is divided into 948 long-domiciled citizens (77%) and 266 new citizens (23%). Facilities were provided for the latter in the existing dwellings; no new settlements for the new citizens have arisen. The 405 employed inhabitants (307 men and 98 women) are predominantly workers, artisans, and enterprise workers of whom 237 are employed in the village (farm-dairy, government railroad, MTGs [Maschinen-und-Traktoren Stationen -- machine-tractor stations], farmers' cooperatives, community administration, handicraft); whereas the remaining (168) are employed in Meiningen, Ritschenhausen, Untermassfeld, and Suhl, due to favorable rail communication. Obermassfeld has become a domicile of workers. Agriculture is restricted to a few enterprises of medium size. Workers and enterprise employees are bound to the soil, possessing land as a rule and carrying out small farming operations, at least raising vegetables and fruits. The community disposes of a good stand of about 2,000 fruit trees and as many berry bushes (according to data of the principal instructor B. Krug).

Untermassfeld developed into a politically more important settlement. Here, from 1150 to 1200, the Hennebergers built a fortified moated castle and held a court from time to time which was a "seat of muses," as was that of the landgraviai castle on the Wartburg and on the Neuenberg on the Unstrut. Here, Wolfram von Eschenbach was dubbed a knight. This Hennebergian fortress was set up as a defense against the episcopal Wuerzburg fortress of Meiningen, and was besieged several times. Until 1829 Untermassfeld was the seat of a magistracy. The total artistic effect of the moated castle was detrimentally affected by modern annexes.

From a phytogeographical viewpoint, the attention of the excursioner is directed to the wealth of flora of the sunny Wellenkalk slopes of the left bank of the Werra between Massfeld and Meiningen: Dippers, Koenigsleite, and Weissbach, which manifest a great number of warmth-adapted varieties of the steppe heath and the steppe-heath woods; asphodels, orchises, lady's slippers, fly orchises, purple orchises, helmet orchises, white and red "Waldvoeglein," and many others. From the small Dippers valley, we go up to the rear Dippers on the "Geschlossene Kller," where the deciduous mixed forest was cleared centuries before for a sheep pasture and today manifests a rapidly-growing regeneration on a steppe heath thickly overgrown with *Thalictrum minus* -- a heath on which pine, haw, sloe, hawthorn, and juniper have formed a natural botanical community, representing the succession to the mixed forest. From here we proceed to the forest clearing of the Dreissig Aecker lying in the middle of a dense deciduous mixed forest, to the village of Dreissigacker (in 1311, Drizzikacker) -- the "high-lying suburb of the royal residence, affording a long-range view" (Georg Brueckner) in the flat valley head of the otherwise dry plateau of the same name. In 1350 the village became extinct due to the effects of the pest. In order to shake off the yoke of oppression, the peasants gathered in 1525 under the leadership of Thomas Muentzer to form the great German peasant movement, sacrificing their lives in their struggle for freedom. A century later, the village was sorely afflicted by the Thirty Years' War. The first 4 decades of the nineteenth century brought the village a genuine period of blossoming, when one of the most famous forestry academies of Germany, as well as an agricultural academy, was established in the hunters' castle. The first director was Dr. Johann Matthaeus Bechstein (1757), an outstanding naturalist,

forestry scientist, and writer. A brook, which springs forth into the narrow meadow land, rushes along in the deeply V-shaped, ravine-woods-rich valley of the Werra. We follow the footpath down to Meiningen in order to seek out the Goetz cave on the Dietrichsberg, since this cave will afford a glimpse into the interior of the Wellenkalk mountains. Numerous clefts of a width of a few centimeters to several meters trend approximately in the direction of the valley. The rainwater which filters through the crevassed stone, along with the carbon dioxide which is produced, has a dissolving and, due to the disrupting effect of ice formations, expanding effect on the width of the clefts. Evidences thereof are the numerous small alabaster and calcareous-cinder formations. However, the greatest widening of the clefts resulted from the fact that the block which is inclined toward the valley moves, tilts, and sags against the valley. Thereby it was possible for limestone blocks to fall from above, forming natural bridges. Bones of bison and brown bear have been found in the cave. Numerous parallelly-running clefts lie toward the interior of the mountain. Thus we can establish "a migration of the rocks of the steep valley slope toward the valley and into the depths" (Georg Wagner). One day the outer wall will collapse as a rock slide, as has already occurred in the case of the "Eingefallener Berg" [collapsed mountain]. The causes of such rock slides are the following. The Wellenkalk mountains rest upon "clayey feet," i. e., on the Upper Bunter or the Upper Bunter sandstone which conceals gypsum -- and occasionally, salt -- bodies. After longer rainy periods the water which filters through the undulatory limestone becomes "dammed up" on the impermeable clay, occurring as a strata spring. The clay swells up at the same time, however, becoming soft and slippery.

It gives way under the load of the Wellenkalk and becomes faulted out. Thereby, individual limestone blocks slowly tilt in the direction of the valley, sink, and finally drop. Such processes are accelerated when the infiltrating water loosens the gypsum and salt bodies contained in the Upper Bunter formation.

From the Goetz cave we ascend to the Dietz hut on the Bielstein, in order to look down upon the settlement of Meiningen in the narrow, rocky valley. The splendid valley profile between the basaltic residual overthrust mountains, the Hohe Geba and the Dolmar (cf. Figure 3 [of original]), forms the Porta Franconiae -- the gateway to Franconia. Without doubt, Meiningen also belonged to the settlements of Swabian Alamanni with the place-name suffixes "-ungen" and "-ingen." We have the oldest nucleus of the settlement, as well as the later Franconian royal palace, to seek out in the convex bend of the valley slope on the right near Schlafhof. Secure with respect to the danger of high water, the settlement lay on a late Pleistocene fluvial terrace. The younger settlement sprang up in the valley plain under the protection of the Werra and the Bleichgraben. This river settlement was provided a double wall and was called "Harfenstadt" [harp village] because of its harp-shaped outline. In the immediate proximity there was a crossroads of old ways. The Lowland or Nuremberg road of course did not lead through Meiningen, but left the main valley, under the protection of the fortress of Landsberg, and coursed through the Hassfurt, under the protection of the Habichtsburg castle, to the Dreissigacker plateau in the direction of Coburg and Nuremberg. From Meiningen, the Meynbolde road led to Erfurt; this road was used by Boniface when he founded the cloister of Ohrdruf (Ohrdruf) in the eight century. The Werra rail line,

established in 1858, runs through the valley. In the Carolingian period a church dedicated to St. Martin of the Franks arose as the oldest house of God on the youngest fluvial terrace in the millennium-old cemetery (the eastern part of the English Garden or Goethe Park). This church was obliged to yield to a princely sepulchral chapel. Through Henry II, Meiningen fell to Kuerzburg, remaining for more than 500 years under the subjection of the latter, and sitting "like a thorn in the flesh of the Hennebergs." However, as early as 1583 the Hennebergs died out, and the dukes of Saxony fell heir to Meiningen. The Thirty Years' war destroyed the well-being of the town in which fustian weaving and dyeing were blooming industries. The number of inhabitants shrank from 6,000 to 1,300. In the princely period (since 1680) the town received the status of capital. The castle which had been built by Bishop Lorenz von Bibra was expanded in the form of an E, i. e., "Elizabethan castle," into a royal palace. Later a semicircular rotunda was added as an administrative building. After the removal of the town wall about 1800 additional constructions occurred on all sides. After the reconstruction after the great fire of 1874 the town received a latticed outline. Already in the pre-world war I period the town experienced an increasing amount of industrial undertakings (railroad workshops, sawmill industry, breweries, papermaking, and printing). Even though it may have been excelled with respect to its structural stamp by many other capital towns, it excelled many another in the profile of its spiritual countenance. Prophetically, as it were, the town was called "Harfenstadt" in anticipation of the world-wide fame which it was to gain under its artistic duke George II through the contributions of the muses of music and drama. Meiningen became the irradiation point of an ingenious renaissance of the great drama.

Music likewise experienced a classical period of blooming under the most outstanding conductors (Hans von Buelow, Richard Strauss, Fritz Steinbach, Wilhelm Berger, Max Reger). The state and the town of today regard as an obligation the continued patronage of the famous traditions of art as represented in music and the theater in accordance with the legend which shines forth on the state theater which was newly built in 1909: "Built by George II for the joy and elevation of the people."

Recommended is a visit to the castle in which a historical natural-science museum, as well as the theatrical museum with memorabilia of the great period of the people of Meiningen, are located. Also recommended is a visit to the Baumbach house on Burg Street -- the house in which the poet of Meiningen, Rudolf Baumbach, lived and died -- with a local-history museum and a stately herbarium of the poet, and to several older, architecturally more beautiful houses with Hennebergian framework style (the Buechner house of 1596, the rear building at No 20 Georg Street; Hartung house of 1603, at Schwabenberg and Winter Streets; Richter House of 1608, on Post Street).

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 Special geological map with annotations, maps of Themar and Meiningen

11. The Little Thuringian Forest -- Schleusingen -- Suhl

By rail to the Vessra Cloister at the confluence of the watery tributary of the Schleuse and the main river of the Werra. In the fourteenth century the Schleuse was still called Vescera (Old High German "fessera" = "Fessel" [fetlock], in reference to its lower course. The Vesser, which has its source on the Eisenberg, was the river upon which chain smithies were located. The old settlement of Vessra received its name from this river. Founded here in 1131 was a Premonstratensian monk and nun cloister (the nunnery later became a prebendary convent after the transferral of Vessra to Trostaut) which became a center of religious, cultural, and spiritual life in the early Middle Ages, and later, after the full development of its power, the credit institute of the financially-weak Althenneberg. The majestic cloistral church, a three-nave Roman basilica in the form of a cross with high towers towering on the saddle-roofs -- towers from the period of the transition from Roman to Gothic style -- and with a main portal having many subsidiary entrances, burned out in the 1930's. Today the Institute for the Care of Monuments is attempting to maintain the architecturally-valuable ruins.

There where the NeuhoF road crosses the rail line there is an outcropping of Schleuse Pleistocene pebbles from the Thuringian Forest (quartzite and porphyry). To the right of the road there is a small young erosion valley with a low and a steep slope. On the heights on the other side of the Schleuse the Ehrenberg fluvial terrace of the Schleuse is clearly recognizable. The high-lying Wellenkalk zone with a juniper drift left of the road is the Apfelberg, through whose southwestern slope the Themar disturbance intersects. The valley of the Ross Brook broadens

into a caldron shape. In the west it is surrounded by the Wellenkalk mountains of the Apfelberg, the Gerissener Berg, Steinberg, Katzenberg, and the Neuhof Berg; in the east it is surrounded by the Little Thuringian Forest. Neuhof lies in a pocket area in a region of fertile Upper Bunter soil on the one side, with a forest in the undulatory limestone rising to the rear and in the intermediate Lower Bunter sandstone on the other. Neuhof is a domicile of peasants and workers (some of the latter commute to Themar and Suhl). This village sprang up from a single estate -- the Adilotis estate of the Adelhold in 1348 -- and has been called "auf dem Neuen Hoff" (on the new estate) since the Reformation. Now, over the pass between the Neuhof Berg (mu 1) and the sm 2 of the Little Thuringian Forest! In the heights of the pass, the way leads to the Neuhof fault (cf. profile in Figure 31). We now descend to the Ahlstaedt vicinity which extends into the Lengfeld basin. There, where on the valley way to Ahlstaedt the Bischofrod fault (also known as the southwest main fault of the Little Thuringian Forest) intersects, and sm 1 crops out alongside felsite porphyry, a mineral vein containing barytes and fluorites intersects both. The short, narrow valley section of the "Schlangengrund" (Ahlstaedt vicinity) in the Little Thuringian Forest is geotectonically and petrographically informative. The principal rocks are granite and porphyry. However, still present are the last remnants of the former Lower Silurian slate hull into which granitic magma penetrated in the Upper Carboniferous. The slate was transformed into hornstone through contact metamorphism. Such hornstones are to be found in a stone quarry on the eastern side of the Steinberg in the Schlangengrund, as well as in the form of loose specimens often coosified with granite (Figure 32).

A fluorite vein also intersects the terrain here. The Herrenstein Mine was formerly located on the Steinberg; here earthy brown hematite ore, spathic iron ore, and barytes were mined. Situated in the Zechstein border of the Little Thuringian Forest, where the valley broadens, is the small settlement of Ahlstaedt in a pocket zone at the confluence of a series of geological formations: tree-covered Paleozoic erupted rocks which rendered possible some scanty mining for about a century; fertile Zechstein formations which are being agriculturally utilized; lettes in the vicinity; dolomite in the sloping area; rising middle Lower Bunter sandstone which has a cover of woods. The Zechstein covers the granitic subjacent stratum (cf. profile in Figure 31). At the fork of the road at the southern egress of the village there is an outcropping of platy dolomite which forms a precipitous slope in the terrain in the direction of Gethles. This slope is covered with steppe-heath-like "Schafschwingel" and "Fiederzwenken" fields, while the road courses through the lettes of the Zechstein. At the cut-off point of the Ross Brook in the Little Thuringian Forest there is another outcropping of felsite porphyry, and in the trenches along the Neuhoof road (where it links with the road from Ahlstaedt to Gethles) there is an outcropping of the sandstone of zu -- the equivalent of the Zechstein conglomerate.

Gethles (in 1360, Getelings = settlement of Geteling) is an irregularly-laid-out village with a distinct nucleus. It is located in a pronounced pocket zone in the middle of fertile tilled fields of Zechstein and lower Bunter sandstone. It is for the most part a pure peasant village. In the Kohlweg at the egress of the village there is an outcropping of sandstone slabs of zu 1

(step of the conglomerate). Toward the south there is again granite, intersected with barytes and covered with a stand of *Callunetum vulgaris* (heather community). On the Kuhberg, near a field-pear tree, a narrow block of lower Zechstein has become stranded between two parallel faults. Here, the limestone was converted through metasomatism into iron ore (spathic iron ore Fe Co_3); in early times it was mined in three mines. Between Gethles and Rappelsdorf, opposite the Rappelsdorf knob, where the road descends to the Schleuse Valley (where contour 1,100 crosses the road), the platy dolomite affords us the opportunity of gathering characteristic fossils: *Schizodus obscurus*, *Ancella hausmanni*. The Hercynian-trending Zechstein strip descends with the highway into the spacious Schleuse Valley; near Rappelsdorf it is covered with Pleistocene gravels. Lying near Rappelsdorf is the Totenlache, about which legends have been woven -- an irregularly formed sink lake which developed through the dissolution of Zechstein salts and the breaking off of hanging sandstone strata. This sink lake has interesting flora: *Batrachium divaricatum*, *Myriophyllum verticillatum*, *Triglochin palustris*, *Potamogeton obtusifolius*, *Heliocharis acicularis*, *Scirpus Tabernaemontanus*. Still another beautiful exposure in the obliquely crevassed platy dolomite is to be found between Rappelsdorf and Schleusingen west of the rail line. The platy dolomite manifests a Cambrian folding in which the anticlinal and synclinal axes run from southwest to northeast.

Schleusingen: the old town, which was surrounded by a wall into the nineteenth century, is situated in a spur or projection spur at the confluence of the Nahe and Erle. It is extended a bit toward the main valley which has given the town its name. Situated like a throne on the southwest apex of the sandstone rock is the

Bertholdsburg castle, the residence of the princely counts of Henneberg until 1583. Until 1815, town and Land were under Saxon control; in the period 1815 to 1928 Schleusingen was a Prussian Kreis capital. The industrial localities of the hinterland, to the extent that they belong to the source-brook fan forming a confluence near Schleusingen, are bound extremely closely to the town. Due to its advantageous location, Schleusingen is the center for the distribution of goods, a supply point, and a shopping place for the foresters. Already in the Middle Ages Schleusingen was a commercial center on old trade routes (on the Wald or Leuben road, as well as on the Frauenwald road), and today the town has been drawn into the railroad network: since 1888, through the branch line Themar-Schleusingen to the main communication line of the Herta Valley; since 1904 the branch line has been expanded to a trans-mountain railroad with rack rail to Ilmenau, later gaining in importance because of the shortening of the time consumed in travel after the abandonment of the rack line. Since 1911 Schleusingen has been linked with Suhl through a border rail line; it has thus been linked to the important North-South line (Berlin-Stuttgart). Due to such favorable communication facilities, many industries and trades were able to develop. For example, sawmill industry and wood processing, which found their roots in the densely-wooded environs; glassworks industry (the Friedrich Works) and glass-instrument production; a hosiery factory; paper, cardboard, brick, and brush production; chemical industry. A visit to the geological collection in the Franke Museum of the Bertholdsburg is recommended.

Now, by rail from Schleusingen to Suhl, upwards in the valley of the Erle near the mouth of the Vesser, past Haasen-St. Kilian with a very old church. Then over the long Erlau which takes its name from the former alder stands of the damp Recent deposits of the flood plain. Only a relatively narrow strip of Middle Bunter sandstone on both sides of the river is used for agriculture; otherwise, homogeneous spruce woods cover the sandstone. Agriculture on a still lesser scale is carried out in the more constricted valley near the row-village of Hirschbach, a settlement of poor forest smiths of the sixteenth century. These smiths prospected for ore in the nearby iron mines, smelted it in a hearth with charcoal, and processed it in the ironworks on the forest brook near their mud cottages. Today there is a wood-products factory. In addition to modest-scale farming, Hirschbach is the domicile of workers of nearby Suhl. Again and again we can observe from the train the typical botanical cover of the sandy soil: *Sarothamnetum scopariae* and *Callunetum vulgaris*, both interfused with white-stemmed birches and sallow. Near the railroad station of Hirschbach, the valley of the Finstere Erle leads upwards between the prophyritic Broehberg and the micaphyritic Adlersberg, which are visible from the train; whereas the railroad in the Doellgrund in the region of coarse-grained sandstone ascends further to the crossroads of Suhler and Friedberg, where the railroad approaches close to the great marginal dislocation of the mountains. Past magnificent sandstone exposures, with a glorious view of the valley of the Lauter and the village of Suhl, past the row-village of Suhler-Neundorf (today, Suhl $\bar{\text{I}}$), to Suhl. The bustling industrial town of Suhl (population 25,000 as of 1946) lies on the great marginal dislocation of the Thuringian Forest. The

northern part of the town lies on granite, the southern part on middle Bunter sandstone. Manifest in the marginal crevasse are the two settlement and geographical factors which led to the founding and the industrial development of the town. One of these factors is represented by the CaCl_2 -containing brine springs, after which the settlement (originally called "Sule unter der Leube" in 1232) was named. The brine of Suhl was processed in the sixteenth century. Both springs are used for bathing and for drinking water. The other factor is represented by the productive iron mines in the seventeenth and eighteenth centuries, which resulted in several blossoming iron industries at the margin of the mountains. The veins on the Domberg and the Doellberg rendered a good, easily-fusible hematite of a high iron content. In Suhl, however, workers began to process the ore for the production of small arms which soon brought the locality intra-European fame. Representing the emblem of the town, there is a stone image of an armorer's-workshop on the market-place well. But the town's destiny was tragic: Suhl, the armorer's workshop of Europe, which delivered all armies with muskets and arquebuses, was perhaps the most adversely-affected of all the Hennebergian cities by the Thirty Years' war. Mining disappeared in the nineteenth century; the last mining attempts were carried out in the period 1853-57. Precision production of all types of arms was carried on. Again and again setbacks were encountered, so that the weapon masters and rifle makers were obliged to relocate. After the Thirty Years' War, the bleaching industry came to Heidersbach, and the fustian-weaving industry to Suhl, as provisional industries. In the nineteenth century the porcelain (disappearing later), wood, and leather-goods industries made

their appearance. Above all in Suhl, as in Zella-Mehlis, the further development of the precision-mechanics industry had become a thing of necessity, and this very industry was one in which the appropriately-gifted local people, who were experienced in precision work, were able to find success. Today the following are represented in Suhl: the lifting-device works ABUS VEB [Ausrustung von Bergbau und Schwerindustrie, Volkseigener Betrieb fuer -- equipping of mines and heavy industry, the people-owned enterprise for the]; weapons factories; tool factories; metal foundries; the production of motor vehicles, bicycle and sewing-machine parts, metal goods, household machines, iron furniture; the Fortuna Works MEWA VEB [Metallwarenindustrie, Volkseigener Betrieb fuer -- metal-goods industry, the people-owned enterprise for]; wood processing; sawmills; leather and clothing trade. All the larger enterprises are people-owned, e. g., the Simson Works, the Thaelmann Kombinat, the IKA [Installationen, Kabel und Apparate -- enterprise for the installations of cables and apparatus] Equipment-Producing Plant. In 1952, in accordance with the new division of administration of the German Democratic Republic, Suhl became the capital of the Bezirk of the same name of eight Landkreise.

Now, from the market place of Suhl to the "Albrechtser Berg," and from here in the northeast direction towards the Domberg. In a narrow pass there is an exposure of sm with a pronounced northeasterly dip. Near a beech, the main fault of the Thuringian Forest passes through. Middle Bunter sandstone is embedded near porphyrite which here is permeated with barytes veins. Of the three paths which come together here, we choose the middle one on which to ascend over micaphyre which contains

iron in places (hence its red color). In former times it was often mined. Tuff breccia crops out on the way to the lookout tower. It contains angular fragments of porphyrite and porphyry which have been cemented together through tuffaceous binding media.

The panorama afforded by the lookout tower on the Domberg (the various points are indicated on the platform):

Toward the northeast, the Zella-Suhl-Heidersbach mountain fault pit -- an excavation of Hercynian longitudinal extension in granite with soft forms and inextensive forest cover. Two source-brook fans drain the densely-populated fault-pit mountain on the Mehlis side to the Lichtenau and the Schwarza, and on the Suhl side to the Lauter which cuts through the marginal wall in the southwest, to which the Domberg belongs, in a narrow valley. Here lies Suhl, the industrial town which, like Sonneberg, expands cornucopialike from the narrow valley. Other settlements in the mountain fault pit are Zella-Mehlis and Goldlauter with the village part of Heidersbach. Bounding the granitic mountain fault pit toward the main ridge of the mountains is a likewise Hercynian-trending fault -- the Heidersbach fault. Located on the main ridge are porphyritic residual covers of the Rotliegendes era: Beerberg, Fichtenkopf, Finsterberg, et al.

Toward the south, the densely-wooded Bunter-sandstone region in the piedmont of the mountains with the Schneeberg and the Suhl Steinsburg, which is intersected by a basaltic vein which lies in the Grabfeld basaltic-vein system (the two Gleichberge, Dingslebener Nacken, Ermelsberg, Feldstein, and Steinsburg near Suhl).

Toward the west lies the basaltic Grosser Dolmar with Kuehndorf on the post-basaltic leveled-off area; in the background are the basaltic residual overthrust mountains of the Vorrhoen: Hahnberg with typical marginal settlements (Sinnerhausen Cloister and Huempfershausen). A most characteristic picture is offered by Bayer, Stoffelskuppe, Dietrich, and Fless; the basaltic covers of the first and third mountains rest upon shelly limestone; those of the second and fourth upon Bunter sandstone. Hereby, the various formations have developed (cf. Figure 8 [of original]).

Toward the southwest we see the post-basaltic leveled-off area near Meiningen with the plateau settlement of Dreissigacker. Rising thereabove is the plateau-forming residual overthrust mountain of the Geba with the settlement of Traebes. Visible behind the Vorrhoen are the Hohe Rhoen: Schwarze Berge, Kreuzberg, Himmelstunkberg, and Wasserkuppe.

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Special geological map with annotations, maps of Themar and Schleusingen

12. Hildburghausen and Environs

Hildburghausen is the typification of a former princely city; its transformation occurred in the nineteenth and twentieth centuries.

Upward, from the Marien road (Road of Friendship), via the footpath west of the Geimecke House, over the incline of the Upper Bunter! Covering the path are dolomites and limestones of the higher Upper Bunter step -- rocks which here manifest only poor exposure. Then, turning off horizontally toward the west, we take the steep path up over Wellenkalk whose decomposition products cover the way in the form of small, for the most part nut-size fragments, so that harder rock benches of this step occur only seldom. There, where the original vegetal cover still exists, as in the mountain "gardens" which are overgrown with greenery, it assumes the form of bushy deciduous woods or steppe-like drifts in which *Festuca ovina* and *Brachypodium pinnatum* condition the prevailing colors. In March the gleaming yellow of *Potentilla verna* shines forth; somewhat later the violet of Pontian-Central European *Anemone Pulsatilla*; in May, the pure white of Pontian *Anemone silvestris*. Forming plant communities with the latter are the "Pontiker": *Bupleurum falcatum*, *Hippocrepis comosa*, *Veronica Teucrium*, *Polygala comosa*. From the ruins we enjoy a view of the former royal-residence town of

Hildburghausen whose process of development is typical of so many Franconian towns which were once the residence of worldly or ecclesiastical sovereigns. It is situated on Pleistocene sandy, clayey, and loamy sediments on the right bank of the Werra. Hildburghausen (Zu den Hausern des Helipert) originated near an early Middle Ages fortress (moated castle) of the Helipert (Hilpert) at the site of the present market place. Berthold von Hunneberg had walls and moats built around it, thereby making it a city in 1324 and a further strongpoint in the fortified line represented by Koburg-Heldburg-Straufhain-Hartenburg toward the bishopric of Wuerzburg. Remains of the elliptical fortified line still exist today. Under the son of Duke Ernest the Pious of Gotha, the until-then modest town of artisans and peasants was elevated in 1684 to the royal-residence of the principality of the same name. The architecturally-inclined dukes of Hildburghausen fostered in northern Franconia the arts of the rococo and baroque, as did the ecclesiastical sovereigns in the cities of Main-Franconia. The castle and the artistic Frieden Park (Irrgarten), a magnificent park patterned after that of Versailles, are the creations of the first dukes of Hildburghausen. Moreover, it was not the least due to the influence of these sovereigns that the Church of Christ was built, patterned after the Dome des Invalides of Paris. (The castle was destroyed when besieged.)

It is remarkable that castles, manor houses, and chapels of Franconian baroque style (Koenigshofen, Ipthausen, Trappstadt, Roemhild with baroque high altar, and the small royal residence of the upper Werra Valley) rose up on the road (much traveled since the more recent Stone Age) from the Main, through the valley of the Franconian Saale, as far as the Grabfeld and the upper Werra Valley. In like manner, if not to the same extent as in the

cities of Main-Franconia, the people of these little towns made the courtly art the art of the people. After the great fire of 1779 the town took on a closed-type town plan, the houses of Markt Street had to be built with three stories, those of the side streets with two stories; now the glorious appearance of the marketplace with the town council hall assumed a newness through additional construction, and the baroque and rococo art forms were assumed by many a citizen's house under the influence of the court. The first organized expansion of the town toward the north occurred in 1710. This was manifest in the new town in which expelled French families settled.

In 1826 Hildburghausen was no longer a royal residence. However, the small part of the town which counted scarcely more than 7,000 inhabitants within its walls, remained that which it had become -- an ecclesiastical center. In the Middle Ages, Hildburghausen was the dividing point of traffic from Gotha and Erfurt: for the one part, to Wuerzburg via the Leimrieth Pass to Bechheim, Simmershausen, Koenigshafen; for the other, over the Birkenfeld Pass (later, over the Stadtberg) to Rodach, Coburg, and Nuremberg. In 1858 Hildburghausen became a station of the Werra rail line. This line, today replaced by an omnibus line, linked Hildburghausen with Heldburg and Lindenau-Friedrichshall. However, Hildburghausen does not enjoy the topographical advantage of two industrial localities of its Kreis: Eisfeld and Themar, which have taken up the industrial hinterland of the Thuringian Forest for themselves. Hildburghausen did not develop into an industrial town; however, an animate ecclesiastical center developed within its walls. In the period 1828 to 1874 the town was the seat of the world-famous Bibliographic Institute whose founder, the ingenious Karl Joseph Meyer, rests in the cemetery of the town. Only a few years after the relocation of this world

institute in the city of the book trade of Northern Germany, Harmsen Wilhelm Rathke founded in the same rooms of the Brunnquell House one of the first German technical institutions of learning which soon attained a standing which extended far beyond the confines of the Fatherland, counting at times more than 1,400 students and warranting anew the title of honor which Hildburghausen had already previously received -- "City of Students." In the nineteenth century followed expansions from the nucleus of the town and the new town section toward the east, west, and southwest. A "settlement" in the northeast section of the town also developed. Hildburghausen is a Kreis capital. Today the town is the seat of manifold trade (publishing houses; clothing; furniture; VVB [Vereinigung Volkseigener Betriebe -- Association of People-Owned Enterprises] for wood; magnesite cement factory; bicycle production; TWA [Technische Eisenwaren -- industrial iron goods] plant for the production of bolts, screws, etc, and the processing of wood; wood products; Saros workshops for applied arts).

For the enjoyment of the panorama afforded by the lookout tower on the Stadtberg, one should refer to the Kundblick vom Aussichtsturm auf dem Stadtberg bei Hildburghausen [Panorama from the Lookout Tower on the Stadtberg near Hildburghausen], published by the Association for the Improvement of Local Amenities, and the present geological profile of Walden and Heideburg (Figure 34).

Before us, on the right bank of the river, we see the lower Bunter sandstone block which rises gently toward the north. This is the principal step of the Kaehten or Chirotherium sandstone. In the background the Thuringian Forest rises from the Grosser Hermannsberg to the Bless.

Geotectonically, this part of the Thuringian Forest represents the Oberhof trough which is filled for the most part with Rotliegendes sediments and porphyritic covers (Figure 1 [of original]). The Grosser Beerberg (963 m) and the Schneekopf with its tower (1,000 m) are porphyritic knobs of the Oberhof step. Adlersberg (with tower) represents a porphyritic residual overthrust mountain of the Gehren step. Before Neustadt on the Rennsteig is the great granitic massif of the Burgberg with a contact-metamorphosed Lower Silurian hull. The Hohe Wart, the woodless Simmersberg, and the Kless near Eisfeld all belong to the Schwarzburg saddle.

The mountain piedmont with the Wiedersbach fault is not visible through the heights of the Stadt Forest which lie between. To the left of the Werra, the cuesta of undulatory limestone rises over the lightly rising Roetsockel. Thusly can also be explained the asymmetry of the expansive Werra Valley (see also Figure 34). South of the Werra, the shelly limestone forms the so-called Franconian rise which inclines slightly toward the south. The dependence of the valley form on stone is manifest quite clearly by a comparison of it with the trough-shaped Leinrieth Valley which cuts into the Roetsockel. The small valley on the opposite Wallrauber Berg in the region of the Wellenkalk manifests a typical V-shape. Between ruins and the lookout tower, the Terebratula step of the Wellenkalk is excellently exposed in a stone quarry. The stone quarries on the Wallrauber Berg belong to the Schaumkalk step. As all the exposures of the Stadtberg (which we shall subsequently visit) decisively indicate, the Triassic strata dip toward the south (cf. also the profile in Figure 34). Our excursion toward the

south brings us more and more to younger strata. Straight ahead and toward the south there are beds of Upper Wallenkalk and Middle Muschelkalk. Sophiental (or "Doerrhor") lies in Upper Muschelkalk as do Pfersdorf and the Hahnritz. Near Stressenhausen there is an outcropping of Lettenkohl of the lower Keuper. The further we advance toward the south and the southeast, the younger are the Keuper strata that we attain: the Feste Koburg lies on km 7; the Tonberg near Ummerstadt, Altenstein, whose church tower on the heights beckons to us, Zeilberg, and Bramberg belong to the upper Keuper. Behind Altenstein a Jurassic formation appears, and in the Alter Staffelberg, Spitzberg, and the Staffelberg proper the entire Jurassic formation is exposed. A series of basalt-crowned knobs rise up from the Keuper landscape: the two Gleichberge, the Dingslebener Kuppe, Strauheim, Zeilberg, and the phonolitic knob of the Heldburg. Appearing in the southwest in shining white is the Ursulakapelle on the sandstone ledge, from whose slope the Franconian Saale springs. Appearing far on the horizon, to the right of the Kleiner Gleichberg (Steinsburg), is the Hohe or Plattenrhoen with the Heidelberg and the Wasserskuppe. Visible mountains of the knobby Vorrhoen are the twin peaks of the Hutsberg and the Neuberg, and the residual overthrust mountains of the Miesburg and the Stoffelskuppe, as well as the Grosser Dolmar in the northwest.

The Franconian rise has a plateaulike character; it represents the remains of an old terrestrial surface. The remains of a still older leveled-off terrain form the surfaces of depositions of the basaltic covers of all the basalt knobs mentioned, of the Plattenrhoen, and the summit of the Thuringian Slate Mountains, at least in the region of Paleozoic slate. If this elucidation is

relevant, they can be considered the work of a pre-basaltic degradation; whereas the terrestrial remains of the Muschelkalk mountains represent the result of a post-basaltic degradation phase in which a third degradation phase is still active on the erosional carving out of the relief of today.

The post-basaltic stream channels thus logically drain for the most part in the southwest direction (cf. the sketch of the river-valley fan in Figure 4 [of original]). A primitive drain used for a time the V-shaped notch of the Gruenhof and the Zedelfeld Grund, flowing along the Grosser Gleichberg to the Hochberg west of Trappstadt and further toward Kannungen. At another period, it coursed through the Heimriether Pass, through the Schlechtsart Rinne, and then again toward Kannungen. The Birkenfeld Rinne was used by an Urbiber which took partially the course of the present-day Rodach and which presumably took up the Harrasser Urwerra, flowing through Compertshaeuser or the Leitenhaeuser Rinne to the Kannunger Rinne, also flowing for a time in the direction of the Baunach of today toward the southeast.

The soil conditions and the microclimate, which in part has been modified by the rock pavement, are in correspondence with the zonal alteration of the vegetation. The region of Bunter sandstone, with its water-storing, clayey horizons, is in general rich in springs, damp, and tends toward an upland-moor formation, accordingly harboring extensive coniferous woods with a northern vegetal character, as well as oceanic heaths. The better soils of the Middle Bunter sandstone towards the valley, the Pleistocene aggradations, and above all the heavy, clayey Upper Bunter soils on both sides of the river are utilized for farming; whereas

the alluvial valley soil is used almost exclusively as a grazing meadow. The northern beds of Wellenkalk harbor the Leiten Forest (used in old times as a central forest), a deciduous-mixed forest of a Central European floristic character; whereas the cover of the southern beds is of heath woods and steppe-heaths, in which Pontian and Mediterranean types appear, in addition to Central European steppe-heath plants. Extensive deciduous and coniferous forests cover the terrestrial leveling in the region of the Wellenkalk. Only the deep, marl-rich Middle and Upper Muschelkalk (especially the Rodusus step) are fully utilized for agricultural purposes. In the Grabfeld Keuper there is an alternation of fertile, expansive troughs with extensive, low, wooded heights for the most part of harder, more resistant rock, and with basalt-crowned, densely-wooded knobs.

An exposure in a stone quarry shortly before the Doerrhof west of the Koburg Road affords us a good look into the dip of the limestone strata toward the south. The stone quarries east of the Koburg road exhibit the syncline and upwarping of the Triassic strata with Variscian strikes. Our way now leads us through the "Meyersberg," past the tomb of the "Dunkelgräfin" (presumably the daughter of the last king of France and Marie Antoinette) near the mountain inn of the "Schulersberg," back to Hildburghausen.

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13. Hildburghausen -- Bruennhof -- Dingleben -- Steinsburg

Over the Franconian rise to the Celtic oppidum on the Steinsburg.

Near the signalman's hut below Haeselrieth, we take the upward-sloping Bruennhof road. The clay shale and clay marl of the Upper Bunter, here predominantly manifesting grey-blue, are exposed on the boundary of the Leiten Forest.

At the sharp bend of the way thick yellow Upper Bunter dolomites and Lower Wellenkalk strata have produced gravity faults manifesting small forms of rock slides. The slumping masses are separated from the parent wall by a fault trough. The entrance to the Bruennhof Valley represents a remarkable valley formation. The valley is lacking the characteristic wide, pear-shaped funnel. It is here a question of a former Schleuse valley, beheaded by the Werra, in which today the Bruennhof Valley has more deeply entrenched itself. It is one of the frequent dry stream beds of the Wellenkalk. In my opinion, the Urschleuse of the post-basaltic terrain flowed toward Zeilfeld in the opposite direction of flow of the Zeil Brook of today.

Indications thereof are the Thuringian Forest gravels close to the Reurieth-Zeilfeld road between Zeissengrund and Zeilgrund and at the southern egress of Zeilfeld close to the Roemhild road. Whereas the Bruennhof Valley of today has increased in depth in the old direction of flow, the Zeil Brook has deepened the post-basaltic channel in the opposite direction of flow. There where the Bruennhof road links with the Reurieth-Zeilfeld road, a still-original and beautiful steppe heath covers the Wellenkalk stone. Here the Mediterranean *Euphorbia verrucosa* finds one of its northernmost habitats in a community of other characteristic plants of the Wellenkalk: *Anthericum ramosum*, *Brunella grandiflora*, *Bupleurum falcatum*, *Euphorbia Cyparissias*, *Sanguisorba*, *Thymus Serpyllum*, *Brachypodium pinnatum*, *Koeleria pyramidata*. Here the attention of the phytogeographer is directed to the dense vegetal cover of the small heath forest on the Lerchenberg near Pfersdorf. We reach this forest by wandering from the Bruennhof in the side valley which enters from the left, and proceeding upward toward Pfersdorf. The steppe heath at the edge of the small heather woods is distinguished by an abundant growth of the Pontian *Ocrotites lutea*. A few years ago a number of Neolithic stone ax hammers were found in a nearby field.

Following the "S" way-marker, we now cross through the dry stream bed of the Zeissengrund, and on the level area of the Upper Wellenkalk and Schaumkalk we gather river gravels from the Thuringian Forest (pebbles and phyllites) and coarse-grained sandstones, rocks which could have aggraded only one Urscleuse, as already indicated by Proeschold (1892). However, they are not of the Pleistocene age, as the latter asserted, but of the Tertiary

times, i. e., post-basaltic. Now, through the "Edelmannseichig" with the fresh greenery of a deciduous mixed forest and a monotonous spruce forest which at best is remarkable due to some stately white firs, again down to a dry stream bed, and via a field way, to Dingsleben. Dingsleben, a very old settlement in northern Franconia from the first period of settlement (perhaps originating before the year 500), is mentioned as Tingelsala in the deed of gift of the lady of noble birth Emhild (the founder of the cloister of Milz). The locality is a street village, i. e., laid out along a single street, in a pronounced pocket area, viz., in a hidden mountain fault pit with extensive fields in marlaceous Middle and Upper Muschelkalk (Nodosus level). The Franconian farmhouses with Hennebergian structure are situated with their gable sides facing the strikingly broad village street in such a way that each house invariably projects a bit outward from the previous house.

Under the old lindens before the deciduous forest of the Nacken we are afforded still another glorious view of the old village settlement. Beyond the basaltic wave-worn marly soil of the Nodosus level, past the western edge of the Nacken Forest, through a bilberry-beech forest (Myrtillus type), upward to the Steinsburg.

There where our road cuts across the road coming from Roemhild-Haina there is a weak indication of the remains of the younger outer ring of the prehistoric Steinsburg settlement.

Following the Roemhild-Haina road through an ancient beech forest of the dog's mercury-woodruff type, we come to the younger main wall, and further to the older main wall near a rock bench.

(See Figure 35 which illustrates the fortification lines.) From this point we enjoy the view toward the north: we find ourselves approximately in the heights of the pre-basaltic terrestrial surface. Below us is the broad, post-basaltic leveled-off area; directly before us is the basaltic Dingsleben neck; to the rear of the latter, the St. Bernhard-Beinerstadt-Wachenbrunn plateau (cf. geological profile in Figure 26) with the spacious synclinal valley of the Juechse and an upwarping (Bibra saddle) toward the Keuper of the Grabfeld -- an upwarping which extends as a ridge from the Steinsburg toward Rentwertshausen: Schwabhaeuser Berg, Eisenhuegel, Wolfenhardt, Grosskopf, Queienberg. Toward the north-northwest we can make out the Dolmar with a basaltic cover which in turn rests upon the remains of a pre-basaltic terrestrial surface and which (the Dolmar) has a Celtic circular wall. Toward the northwest and the west we see the basaltic knobs of the Rhoen with remains of the pre-basaltic leveled-off terrain and the Celtic summit castles of the La Tene period: Oechsen, Bayer, Diesburg, Alte Mark, Milseburg, and Kreuzburg. Proceeding further to the older main wall toward the east, we enjoy a beautiful view of the Thuringian Mountain chain. A number of dwellings were built in the dense dog's mercury mixed woods after clearings were made. Poles closed up with mud and straw once encircled the house excavations.

We again walk along former dwellings after we have passed the long, narrow plain which is located within the inner ring.

Reaching the mighty rubble drift, we enjoy a beautiful view toward the east: the valley of the Milz River which comes from the Kleiner Gleichberg and flows around the Grosser Gleichberg in the spacious valley; the Bedheim trough which continues toward the east in the valley of the Rodach.

It is anthropogeographically remarkable that this broad, northern valley channel of the Franconian Keuper landscape represents an important anthropogeographical structural line, inasmuch as in the Franconian settlement period (531-900) this extended valley channel attracted a popular Franconian migration from the west to the east. Here sprang up the great Franconian irregularly-laid out villages with the suffix "-hausen": Simmershausen, Stressenhausen, Eishausen, Adelhausen, Massenhausen, and Lemperthausen.

Now, past the Celtic Hut which is dedicated to the memory of the first explorer of the Steinberg, the Hofrat Dr. Jacob, to the west side of the mountain which affords a glorious view of the southern Rhoen, the Hassberge, and the Steiger forest; before the Kleiner Gleichberg, the Michelberg; before the Grosser Altenburg and Hartenburg, in the fertile dale near a spring, Roemhild; and further in the distance toward the Hassberge, the ancient Koenigsshofen.

In reference to the anthropological history of the Steinsburg castle: the Steinsburg was inhabited since the younger Neolithic, as indicated by numerous prehistoric finds. Its blossoming period extended from the late Hallstatt era (700 to 500 B. C.) to the La Tene period (first century B. C.). Celtic emigrants from the Rhine region built the castle which was further developed -- due to its predominant situation and the long-range view it afforded -- into a Celtic oppidum in an extensive belt of Celtic summit castles against the danger of the Teutons threatening from the north. The walls were from 4 to 5 m in width and had a total length of 11 km. Judging by certain folk tales, it can be assumed that the Steinsburg was a shrine of Odin in the barbarous

Teutonic period, and later a pilgrimage chapel of St. Michael in the Christian epoch (this latter is confirmed in documents). Descending to the forest house, we see the Grabbrunnen wall which still stands within the younger outer ring and which served the security of a rich wall in the lower part of the mountain. A genuine earth dam can be seen in the earth wall which dammed the spring water.

The near and more distant environs of the Gleichberge are rich in prehistoric finds. Paleolithic discoveries have also been made on the Grosser Gleichberg which is distinguished by a simple basaltic wall, on the Altenburg, and near Haina, Westenfild, and Mendhausen. Ceramic-band settlements have been discovered on the Schwabhaeuser Berg and on the Nerzel Brook below the tuberculosis sanitorium. In the warm period of the post-glacial times the Steinsburg and the Grosser Gleichberg were virtually unwooded. In the following period, due to continuous settlement, woods sprang up only sparingly or not at all.

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Academy of Scientific Annals

Special geological maps of Dingsleben and Hildburghausen with

amotations

14. From the Forest House, over the Grosser Gleichberg, to
Gleichenberg, Milz, and Roemhild

Our excursion embraces the following: the Steinsburg Museum; the Grosser Gleichberg, a significant natural monument; Milz; Roemhild.

A visit to the Steinsburg Museum: this museum is located in the saddle formed by the two Gleichberge; it was built in excellent taste by the court surveyor Behlert. It contains the collections of Drs. Jacob, Kuempel, Bonsack, Kade, and Prof. Dr. Goetze, and was arranged and put in order exemplarily by the last-mentioned. It is primarily intended as an exhibition for all segments of the population, especially for schools, in order to afford them a concrete illustration of the culture of the Steinsburg Celts -- of their ornaments, weapons, tools, textile science, agriculture, etc. At the same time it contains a collection of studies which is available to scientific research at any time. Below the pond near the forest house there is an outcropping of a few remains of calcareous tuff. Before and behind the Steinsburg Museum there is an excellent exposure of the variegated Keuper marl of km 4. The sandy facies of the mountain beech forest thereabove (Myrtillus type) manifests the sandstone beds of km 4 and the level of the Coburg building sandstone (km 5). Then the road leads through the variegated Keuper lettes and white sandstone of km 6 to several beautiful exposures in the arkose level (km 7) on the Rothe Seite of the mountain: dolomitic arkose sandstone. Back again to the marked-out path, and via this to the Roemhild basaltic works.

New geological discoveries on the Grosser Gleichberg:
 Ruehle von Lilienstern and H. Wildfeuer found *Psiloceras planorbis*, *Pseudonotus kurri* in basaltic lava-baked stones near the peak, and confirmed an assumption of Dr. H. Amrich that Liassic formations exist under the basalt. Ruehle von Lilienstern also found Liassic relics on the Straufhain. Thus we can reconstruct a pre-basaltic terrestrial surface and thereby ascertain the displacement of the excavation. In a marly stone bed of the Zandodon marls of the Ko, 14 m below the Raetgrenze, near the Roemhild Brook on the Grosser Gleichberg, Ruehle von Lilienstern found two "Kiesenechsen," the gems of his palaeontological homeland museum in Badheim: *Plateosaurus plieningeri* Huene, a prosauropod, and *Halticosaurus liliensternei* Huene, a coelurosaurian.

Prehistoric times: on the north, west, and south sides, the plain of the Grosser Gleichberg is surrounded by a simple wall of uncut basaltic stone. Such protection was unnecessary on the steeply-falling east side. On the northwest side two wall arms run obliquely toward the Roemhild fault break (this wall is called the Kentmauer). A beautiful stone-axe-hammer was found here. Located on the west slope is a great earth wall -- the Altenburg which Dr. Jacob designated the Viehburg. Dwellings have not previously been discovered.

From the higher talus accumulation we enjoy an informative view toward the southwest, the west, and the northwest. Before us is the Kleiner Gleichberg with an extensive rubble drift on the southwest slope. Behind the latter is the St. Bernhard plateau, sloping on the Schwabhaeuser Berg near Haina down toward

the Grabfeld. Running down from there in the northwest direction toward Bibra is an upwarping of the higher Muschelkalk strata (Bibra saddle), separated from the Grabfeld Keuper by a Hercynian-trending fault -- the "Gleichberg disturbance." We must assume that this disturbance exists in the upwarping between both Gleichberge. It is again in evidence east of Simmershausen (cf. the profile of the Gleichberg in Figure 36). Clearly visible in the ridge of the Bibra Saddle are several V-shaped valleys which were once used by consequent channels of the post-basaltic leveled-off terrain in their southwest course (cf. the sketch of the river-valley fan in Figure 4 [of original]). An Urnahe once made its way through the Haina Pforte which has been deepened still more by the spring of today. At various times the Pforten on the Eichenhuegel near Westenfeld and Queienfeld have been used by an old Hofteichgewaesser. As early as in the Middle Ages an old highway, which was used by Swedish King Gustavus Adolphus, led through the Haina Pforte from Koenigshofen via Roemhild, the St. Bernhard Plateau, to Trostadt, Vessra, Schleusingen, and further beyond the Thuringian Forest. A main road still leads through the Haina Pforte from Bavaria, via Roemhild, into the valley of the Juechse, to Meiningen. The narrow-gauge rail line Roemhild-Kentwertshausen, which serves above all the transport of the basalt stones from the Grosser Gleichberg, uses the natural channel before the Bibra Saddle and passes through the broad flood plain of the Hutsch Brook, extending to the Franconian irregularly-laid out villages of Haina, Westenfeld, and Queienfeld. Toward the west the view sweeps across to the Hoehrhoen: Kreuzberg and Wasserkuppe. Toward the northwest we have another view of the post-basaltic level area: Pfersdorf in the extensive valley head, and Zeilfeld in a pocket area. Here also, old courses of an Urschleuse

can be ascertained. We see the indentations of a Brunnhof channel which used the Zeilgrund of today (only in the opposite direction taken by the brook of today) and then flowed along the Grosser Gleichberg. In addition, still other river channels existed from time to time. Morphologically, they are still recognizable in part. Now, via the marked way, to the trigonometrical point, and further to the edge of the plateau on the south side. Here we are again afforded a glorious view, especially of the Grabfeld (cf. profile in Figure 36). Before us is the extensive Milz Valley which ascends on the other side to the terraced slope of higher levels of the km. Linden lies on the Lehrberg terrace (E) which is covered with Pleistocene formations. Softly-rising variegated Keuper marl with broad tilled fields leads to the E-terrace in km 4. Thereabove is Mipsmergel y VII. Here, the post-basaltic terrestrial surface extends through the level of Coburg Upper Bunter sandstone (km 5), further toward the southeast through km 6 and dolomitic arkose (km 7). Morphologically similar is the landscape of the southwest foot of the Grosser Gleichberg where the landscape, some distance from the latter mountain, belongs to the Schilfsandstein. The swell east of Eicha is the Einfahrtsberg which originated from the effects of a basalt vein from the direction of the Rhine. One can perhaps recognize from the Hochberg southwest of Eicha another old river trace of the above-mentioned Urschleuse (Zeilfeld channel).

Geotectonically, the Grabfeld represents a trough whose axis extends through the Grosser Gleichberg to the phonolitic Heldburg and further to the Tonberg near Ummersstadt (cf. the block diagram in Figure 2 [of original]). The strata dip toward the southeast, so that in this direction ever-younger strata outcrop on the surface.

We can also look into the Kreck Valley which follows this strata dip and is consequently drained. Toward the southeast we see the cone-shaped Straufhain with the ruins of a Hennebergian castle. Our view encompasses further the Hassberge, the Zabelstein of the Steiger Forest, and the Juraberge near Lichtenfels. A magnificent appearance is assumed by the stately settlements of the Grabfeld, of which the irregularly-laid out villages of the Milz Valley belong to the Franconian settlement period: Hindfeld, Gleichamberg, Gleichwiesen, Bedheim, Stressenhausen. On the other hand, the Franconian street-villages of Breitensee, Eicha, Linden, and Simmershausen, which before the separation still manifested the hide type of field distribution, belong to the latter Franconian period.

We now walk on the edge of the elliptical plate on the west side to a basaltic rubble drift with sparse but original vegetation, so that once again we enjoy a view toward the west. Now, we descend by way of the old Hindfeld Holzabfuhr way which apparently used a prehistoric wall. We proceed by way of the horizontal way to the basalt quarry of Gleichamberg on the south side of the mountain. Another great basaltic rubble drift exists on the southeast side. In regard to the disintegration of the wall, see page 57 [of original]. A great bed of basaltic tuff is exposed at the basalt quarry. Specimens of basalt stones lie profusely about; these have the appearance of having been "sunburned"; consequently they are called "Sonnenbrenner." There are grey particles which have incipient cracks; these particles eventually crumble into angular fragments (W. Hoppe). As Steinsburg and Straufhain, the Grosser Gleichberg represents a basaltic knob which originated through the swelling of a basalt vein on its end, and was later carved out by

erosion. Now down to the Hopf basalt works over km 6 which consists of outcropping, variegated limestones and white sandstones, and which here and there is covered by rolled fragments of arkose sandstone (km 7). Outcroppings of km 5 have never been observed in the Gleichberg community forest. There where two small streams flow down from the mountain and then flow to the Milz, at the southeast foot of the Grosser Gleichberg, lies the old Franconian irregularly-laid out village of Gleichberg, built on an ascending slope. It consists of Oberdorf, Mitteldorf, and Unterdorf. The centrum of the village is the high-lying and strongly fortified church (with old peasant paintings and a priceless baroque pulpit). From the cemetery beside the church one is afforded an informative view of the spacious Milz Valley with the afore-mentioned Einfahrtsberg (Figure 2, No 9 [of original]), a basalt-vein rise, and the Franconian street-village of Eiche. Gleichberg is one of the most prosperous localities of the Thuringian Grabfeld. The variegated, mostly heavy Keuper marl soils (km 3 + 4) yield good harvests. The wind-protected, warm location permits extensive fruit culture with quantitatively and qualitatively abundant harvests. The fodder-rich Milz meadows render possible significant livestock raising. According to Dr. Jacob, the great Huegelgraberfeld on the west foot of the Grosser Gleichberg on the so-called Merzel Brook belongs to the older and younger iron age. Here, Prof. Dr. Neumann discovered a band-ceramic settlement where a very old way, coming from Milz, ascended to the St. Bernhard Plateau. As in the case of the Steinsburg castle, so in the case of the Grosser Gleichberg -- especially the southeast slope near Gleichberg -- discoveries have been made from all the prehistoric epochs ranging from the younger stone age to the fourth century A. D.

Our excursion now takes us to Hindfeld, through the Milz Valley which is constricted in Schlifsandstein, to Milz, one of the most interesting of the villages of the Grabfeld. Milz is a Franconian irregularly-laid out village in which the surname Frank is still today strongly represented. Analogously to Wallendorf, an empire-independent royal village (vicus publicus) developed from a fortified farmstead (curtis) -- the present-day churchyard. The fact that Saxons were domiciled here in the Carolingian epoch is evident from the Milz "Wuestensachsen" field designation. A trade road led from Koenigshofen via Herbstadt to Milz, and further (as the "Hohe Strasse") via St. Bernhard into the Werra valley.

After 1650 Milz was also a post station; the riding messengers from Nuremberg to Meiningen and from Schweinfurt-Oberlauringen to Hildburghausen included Milz in their route but not Roemhild. The Thurn and Tax postal building still stands today; it is a tastefully renovated Hennebergian structure which bears a bucking horse as a vane. The impressive village square served the maintenance of animal and retail market which the city of Roemhild took over. An important traffic route still passes through Milz: the Meiningen-Roemhild-Nuremberg road which has gained in importance since the age of the automobile. The form of the peasant settlement is completely that of the Franconian farmstead arrangement. Dwelling and farm buildings group about a rectangular court which is encircled by a fence or wall which in turn is provided with a large entrance gate and a door for the inhabitants. Usually, the gable side of the house is turned toward the street; the long side of the house is so situated only if the latter is a gate or thoroughfare type. One- or two-story Hennebergian-style mudwall structures rise from a foundation which is usually constructed of Schlifsandstein.

The dwelling rooms are located in the fore part of the main building: hall, kitchen, living room, and bedroom. A stall is located in the rear part. A wooden gallery on the long side of the house -- the Franconian bower -- forms a roof over the house door. The furniture of the house is simple: a wooden bench running along the walls of the living room, a heavy wooden table, wooden chairs, and a large porcelain stove which heats the living room and bedroom. Invariably blooming in the window is *Marum verum* or *Teucrium marum*, rosemary, et al. When they go to church, the women pluck a stem of each of the latter, as well as a leaf of fever-few and goat's beard, from the house garden ("Altweiberkirchenstraußle" [old ladies' church bouquet]). Still blooming on the roof and the main wall is *Tempervivum tectorum*, which the great Franconian king once ordered planted in his royal lands as a remedy for burns and as protection against lightning. Charlemagne's *Capitulare de villis* is still reminiscent in what is grown in the peasant gardens of the Grabfeld and what is prepared in the kitchens: "Kuemersalat," "Satterich," and "Fesodich" (*Cucumis*: cucumber, *Satureja*: savory, *Phaseolus*: beans).

From a phytogeographical viewpoint, the reader's attention is directed to the abundant vegetal cover of the Irmelshaeuser woods which is about an hour distant. After crossing the Milz, one sees an outcropping of Middle Gipsmergel y III km 3; there where the way approaches the Irmelshaeuser woods there is an outcropping of argillaceous quartzite slabs of the Corbula bench. We are afforded an informative view of the Milz and Spring Valleys with the old settlements of Milz and the Franconian village of Roemhild. In the background we see the two Gleichberge and the long mountain

ridge of the Bibra Saddle with the three clearly-visible V-shaped valleys of post-basaltic channels of which the eastern valley is used by the afore-mentioned trade road (Nuremberg-Roemhild-Heinungen).

List of the phytogeographically most remarkable varieties of the Irmelshaeuser woods:

<i>Melica picta</i> , Pontian	<i>Seseli annuum</i> , European
<i>Carex praecox</i> (Schreberi), Pontian	<i>Peucedanum officinale</i> , Pontian
<i>Oagea spathacea</i> , North Atlantic	<i>Peucedanum alsaticum</i> , Pontian
<i>Thesium bavarum</i> , Pontian	<i>Laserpitium prutenicum</i>
<i>Th. linophyllum</i> (= <i>intermedium</i>), Pontian	<i>L. latifolium</i> , European
<i>Secum reflexum</i> , European	<i>Androsace elongata</i> , Pontian
<i>Rosa gallica</i> , Pontian	<i>Pulmonaria angustifolia</i> (azuera), Central European
<i>R. pimpinellifolia</i> , Eurasian montane	<i>Stachys rectus</i> , Mediterranean
<i>Milipendula hexapetala</i> , Pontian	<i>Veronica Teucrium</i> , Central European-Mediterranean-Pontian
<i>Potentilla alba</i> , Mediterranean-Pontian	<i>V. spicata</i> , European
<i>P. rupestris</i> , Mediterranean-Pontian	<i>Digitalis ambigua</i> , Central European-Mediterranean-Pontian
<i>P. thuringiaca</i> (parviflora), Pontian	<i>Melampyrum cristatum</i> , Central European-Pontian
<i>Trifolium rubens</i> , Mediterranean	<i>Galium boreale</i> , Pontian
<i>Astragalus Cicer</i> , Mediterranean-Pontian	<i>Aster Linosyris</i> , Central European-Mediterranean
<i>Lathyrus niger</i> , European	<i>Crepis praemorsa</i> , Pontian
<i>Geranium sanguineum</i> , European-Pontian	<i>Anthericum ramosum</i> , Mediterranean-Pontian
<i>Dictamnus albus</i> , Pontian	<i>Chrysanthemum eorymbosum</i> , Mediterranean-Pontian
<i>Euphorbia verrucosa</i> , Mediterranean	
<i>Pleurospermum austriacum</i> , Eurasian-montane-sub-Alpine	
<i>Bupleurum falcatum</i> , montane-sub-Alpine	

The abundance of Pontian and Mediterranean varieties on a relatively small area is conditioned by the following: the stony base, the warm Gipsmergel y II in km 1; the location of the woods in the Schweinfurt arid region [see Note below] and on the southwest invasional line Main-Franconian Saale (Wellenkalk-Gipsmergel heights). By means of this line the main invasion of the xeric varieties may have occurred in the dry-warm climatic phase of the postglacial epoch (xerothermic period). Even though some types may be considered advancing even today, with respect to the greatest number of them it must be considered a case of relict habitats.

([Note:] Roemhild: 576 mm, Immelshausen: 500 to 550 mm of precipitation; within the -10 mm isanomal, i. e., receiving 10 mm precipitation too little. The climate is semiarid, almost droughty.)

Regarding the formation of the landscape: In 1926, in spite of energetic warnings on the part of judicious geographers, the improvement of the Milzgrund was carried too far. Drainage ditches, but no irrigation ditches, were dug, and the groundwater level sunk too deeply. Springs of the Grosser Gleichberg dried up or emptied only to a slight extent, because for more than 50 years the basaltic dome on the Roemhild and Gleichberg side was too strongly eroded. Since the 1920's the summery weather, which had earlier been a regular phenomenon, has remained. The hay yield receded; often the Milz meadows were converted into fields which are often exposed to the spring frost in the valley. The effects of the drought of 1947 had a disastrous effect in the drought area of the Grabfeld, and on farming and the forest economy as well (cf. E. Kaiser, "The Drought Year 1947 and Its Effects on Agriculture

and Forest Economy in Thuringia, Uranis, No 6, 1949). The following are recommended: the poplar plantation on the Milz; ditches and meadow ways, the reforming of the Teichwiese into a pond; the reappearance of the Krause Brook Stauweiher at the northeastern foot of the Grosser Gleichberg (a content of about 100,000 m³) for the purpose of the irrigation of the Milz meadow after the first mowing; the arrangement of the irrigation ditches and afforestation of the 20-ha spoil bank on the Grosser Gleichberg. Located on the spring which drains the Franconian rise (and which has deepened the V-shaped valley of a post-basaltic channel (Urmahe) east of the Eisenhuegel above the village of Haina) is the true Franconian village of Roemhild situated on important traffic routes from Meiningen and from Hildburghausen (these run together in Roemhild and lead to Franconia, to Fuerzburg and Nuremberg), as well as on a narrow-gauge rail line which links the village with the Meiningen-Schweinfurt line. It was once the noble residence of a Hennebergian-Hartenburgian family of counts on the Hartenburg, a spur of the Grosser Gleichberg. From 1646 to 1710 it was the noble residence of an independent principality with only three small country towns (Roemhild, Themar, and Koenigsberg in Franconia) and 53 villages. The former noble-residence castle, the Gluecksburg, is now an educational institute. Worthy of a visit is the town church in Gothic style with an artistic baroque pulpit and with the tomb of Count Hermann VIII and his wife Elisabeth, an outstanding work of art of Peter Vischer. With its main street which widens at the street market and which is closed by a gate, the town manifests the rib shape which is typical of many villages.

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15. Hildburghausen -- Wallrabs -- Leimrieth -- Stresenhausen --
Streuendorf -- Straufhain

This excursion leads through the South-Thuringian Muschelkalk, Lettenkohle of Keuper, and bedding dolomite, as well as through the lower steps of the Gipskeuper, to the basaltic Straufhain. Near the "Jaegersruh" inn in Wallrabs there is an outcropping of the red clay shales and clay marl of the Upper Bunter (so) in ditches. Here they are partially sandstonelike developed and bear the bivalve *Myophoria costata* which is indicative of the Upper Bunter. At kilometer stone 1.9 a field way links with the road. At the bend of the field way, 20 paces from the road, there is an outcropping of Upper Bunter dolomite. Above this outcropping there are greenish

and grey lites, often of cellular structure. Cropping out there-
 above and on the field way which runs beside the road, but somewhat
 higher, are *Modiola* calcareous plates which are separated from each
 other by marl. They are characterized by the frequent appearance
 of *Modiola hurundiniformis* and *Myophoria vulgaris*. Opposite kilo-
 meter stone 2, above the same field way and above the *Modiola*
 strata, there is an outcropping of Upper Bunter dolomite. There
 where the field way ends, we see the commencement of the Lower
 Wellenkalk (mu 1) which is concealed by vegetation up to the first
 stone quarry. This vegetation -- where it still manifests its
 original form -- is composed of *Ononis-repens* and *Prunus-spinosa*
 communities. The first stone quarry exposes the lower beds of
 the Wellenkalk: undulatory and nodularly disintegrating limestone
 strata of a characteristic parallel fissuring. They manifest quite
 clearly a southerly dip. A stronger, exposed bench of blue-grey
 limestone which contains *Gervillea socialis* and *Dentalium*
totquatum is abundant in petrifacts. The second stone quarry
 likewise manifests a parallel fissuring of the Wellenkalk and a
 strong occurrence of physical disintegration, due for the most
 part to the expansive power of frost, but also to the destructive
 force of vegetation (grassy wild-rose and sloe-tree cover) and the
 wedge work and expansive power of plant roots. The disintegration
 has led to the formation of the talus accumulation which is being
 overgrown with *Clematis Vitalba* which provides a bright green cover.
 Cropping out 40 paces from km stone 2.5, on the left side of the
 road, are two *Terabratula* beds which are separated from each other
 by Wellenkalk formations. Outcropping 30 paces further are forma-
 tions of Upper Wellenkalk which, from km stone 2.6 onwards, mani-
 fest frequent rock foldings and contortions. Then the Schaumkalk
 zone begins. The lowermost bench is not completely exposed.

Thereabove, according to Proescholdt, there are 3 to 4 m of Upper Wellenkalk formations, then Middle Schaumkalk (1 m thick), again Wellenkalk, which is parallelly fissured, thereabove the 2/3-m-thick Upper Schaumkalk bench, and over the latter, Orbicularis plates in the form of a hanging wall. The Schaumkalk formation can be seen exposed once again in a deserted stone quarry above the small forest with "Niederzwenkenfohrenwald." The cliff above us is the crinoidal limestone level (no 1). From a geomorphological standpoint it is to be mentioned that here, where the two remarkable quarry-stone horizons trend toward one another, the Leimrieth Valley narrows into a necklike constriction. At the boundary of mu 1 and mu 2 the brook manifests infiltration phenomena, due to the abundant fissuring of rock. Conditioned by the overfaulting of rock, the extensive pear-shaped valley head of the Leimrieth Valley begins above the valley constriction. This valley belongs to the Middle and Upper Muschelkalk and consists predominantly of marly-clayey soils. Thus, the Leimrieth Valley clearly manifests three parts: a spacious valley head, a V-shaped valley in the Wellenkalk, and a synclinal valley in the lower course, extending far into the mouth in the Upper Bunter and with considerable alluviations near Wallrabs, where in 1952 we found a fossil bone of the old Quaternary Bison bonaeus. In the valley head of Leimrieth, behind the latter, is the Hahnritz (horizontal line) which is indicative of the post-basaltic leveled-off terrain. To the rear are the two Gleichberge which manifest the pre-basaltic terrestrial surface. To the right of the church tower of Pfersdorf there is a source-trough plateau area.

There where the little valley enters from the left near the Lindenplatz, there is a partial outcropping of crinoidal

limestone which affords the opportunity to gather crinoids (trochites). The plattendolomits crop out of mm along the field way which follows the road. Three-hundred to 400 m upward on the left flank of the side valley one can find on the field (lettenkohle-sandstone ku) sporadic specimens of Thuringian Forest gravels which presumably have originated from an Urschleuse of the post-basaltic terrestrial surface. Morphologically, the old stream-channel course toward the southwest is clearly characterized from a high place on the right bank. Behind Leimrieth the Roemhild road forms the watershed between the Werra and Main regions. At this point the valley formation is quite informative. The initial drainage on the post-basaltic leveled-off area was effected by a southwest-trending Urschleuse. After the subsequent Werra course had formed, the Leimriether Brook drained to the Werra, while the Rodach drained toward the southeast to the Main, in the opposite direction of flow of the Urschleuse. Had the struggle for the watershed between both not been halted by the local people -- a struggle which at this very point took up the Roemhild road -- it would have culminated in favor of the water-rich Rodach. The latter would gradually have made of the Leimrieth valley head a tributary. In direct proximity to the rail bed of the Heldburg rail line between Leimrieth and the halting place of Stresenhausen there is an exposure of ku l. There where the field way branches off toward Friedenthal at the fork of the road (Leimrieth-Zeifeld, Leimrieth-Bedheim) there is an outcropping of anoplophoraschiefer with Anoplophora lettica. To the right, at the rail beds, on the way to the Leimrieth shooting stand, specimens of Bairdia dolomite lie about. Here, during the building of the railroad, a one-m-thick coal seam was

exposed. Completely covered with vegetation, it is today no longer visible. Here, Proescholdt (1888) established foldings and overfoldings of the Lettenkohle strata in the northeast, i. e., movement, direction. Similar folding phenomena in Ku (cf. sketch in Figure 38) were observed by the author in the summer of 1927 during the construction of the Bedheim water system. Near the halting place one is afforded a beautiful view of the spacious Rodach Valley with Stressenhausen, Steinfeld, Eishausen, Rodach. To the right one sees the basaltic knob of the Straufhain and the phonolitic knob of the Heldburg; to the right, the Stadtberg. There where the railroad leaves the woods, there is an inextensive outcropping of Grenzdolomit (ku 2) in individual specimens of yellow dolomites which lie about. The latter are nonfossiliferous. The Spitzberg on the watershed between the Bedheim Brook and the Rodach represents the result of a widening of a basalt dike which carved out the mountain into a knob shape. Here the dike intersects the idiochromatic marl of km which outcrops on the south side of the mountain: reddish brown marl, such with quartz breccia, thereabove stone marl and dull red marl with dolomitic sandstone beds. On the heights the marl is baked or burned and platy, i. e., with platy jointing. We follow the north-northwest and south-southwest striking dike, by means of bedrock fragments, beyond the crossroad. The oak-hornbeam woods to the right before us is the Dipperts, the warm stone-marl soils of which harbor a number of xeric varieties: *Rosa gallica*, *Potentilla rubens*, *Astragalus Cicer*, *Oxytropis pilosa*, *Hippocrepis comosa*, *Lathyrus niger*, *Bupleurum longifolium*, *Laserpitium prutenicum*, *La. latifolium*, *Crepis praemorsa*.

From here a visit to the paleontological homeland museum of Hugo Ruchle von Lilienstern, Dr. med., Dr. rer. nat., h. c., in his ancestral castle at Bedheim is recommended. This visit may be undertaken as a half-day excursion by omnibus from Hildburghausen. One may view highly significant finds from the South Thuringian Triassic, among which are petrifacts unprecedented in science. From the plant world: diverse Equiseta, ferns and palm ferns (cycads), Cordaites, conifers (voltzite and silicified *Arucarioxylon thuringiacum*); from the animal world: Stegocephali, the two afore-mentioned *Plateosaurus plieningeri* and *Melicosaurus liliensternei* from the of the Grosser Gleichberg, as well as a track plate of the well-known *Chirotherium* from the Hildburghausen *Chirotherium* sandstone with large and small tracks of extinct *Chirotheria*, smaller *Lauria*, and *Chelonia*. It is the largest and most extensive track plate of Germany.

Now, from the crossroad, via the field way, in the south-southeast direction, past a small oak woods (po. *Rosa gallica f. pumila*), through a wide trough in km 1, to a crossroad near a forest apex. Here the argillaceous quartzite of the Corbula bench outcrops on the way; the latter bench forms a sharp ledge in the terrain. The plates are characterized by relief impressions of mud cracks and casts of the *Corbula Keuperina*. We proceed further along the field way, which now leads along the edge of the forest, and reach the Steinfeld-Streuendorf road. Here there is a very good exposure of the *Estheria* beds (d) of km 1 in stonemarl-like and sandy facies, the latter with *Estheria*. Running through Streuendorf is a basaltic dike which outcrops near the road sign near the entrance to the village. Streuendorf (mentioned as Strufidorf in documents dating back to 800) arose as a Franconian irregularly laid-out village at the crossroad of the two Grabfeld

roads (Hilburghausen-Heldburg, Roemhild-Rodach) in the extensive upper course of the Streufdorfer Creek, in the middle of a fertile vegetable and wheat land, known for important grain and fodder-crop cultivation and principally for intensive swine raising. It is situated on the narrow-gauge rail line Hilburghausen-Lindenau (at present the line has been replaced by an automobile line). Exposed near the Sportplatz are the red marls of km 3, and thereabove, in the intersecting road on the heights, the Lehrberg stratum (E) -- dolomitic limestone. The small elevated area which trends toward the Straufhain is morphologically conditioned by this same limestone. Now, down to the Rodach road. Here the Schilfsandstein km 2 is excellently exposed in fractures: we see fine-grained, grey micaceous, coarsely-banded sandstone, now and then with thin seams of coal. Via the road to the road sign. Here lying about are abundant specimens of the Corbula bench with tracks. On the field way to Straufhain we cross a long basaltic dike. Now, through the beautiful Vinca minor deciduous mixed forest on variegated marly soils of the km 3, in which the level of quartaltic sandstone beds can be recognized as weaker escarpments, up to the basaltic knob. It is here conditioned by the stocklike swelling of one of the many basalt dikes which are characteristic of the Grabfeld. The dike is further remarkable in that it rises under an angle of about 45° , having dragged the contiguous Keuper strata, i. e., having drawn them along upwards, contact metamorphosing them. To be found in the metamorphic area are stonemarl-like hardened clays which have also been partially transformed into porcelain jaspilite. The basalt has a platy jointing at the contact point, a columnar jointing inside. To be found in augen are baked clays and sandstones of the Raet and the Liassic (belemnites). Thus, should one wish to reconstruct

the pre-basaltic terrestrial surface, one must imagine approximately 300-m-thick beds of the Upper Keuper and Jurassic strata as being superimposed. In the southern and western dikes there are basalt tuffs and basalt conglomerates which are intersected by younger basalt dikes, so that at various period dike eruptions occurred: plagioclase basalt and limburgite. Crowning the heights of the knob are the remains of the Straufhain castle, once politically important for the hennebergers. It was destroyed in the Peasants' War. Now, down to Streufdorf, a very old settlement where discoveries from the younger Bronze Age have been made, and whose soil and climate conditions are obviously favorable. These conditions permit abundant grain, fodder-beet, and vegetable cultivation. Thus, the number of livestock had always been great and the importance of swine raising extensive, so that Streufdorf delivered great quantities of young swine to the animal markets of the immediate environs and outlying districts. Industry (agriculture, sawmills, wood products) has also taken hold here. Thus, in addition to its industry, with its amulatory agricultural institution, the HTS [Maschine.-Traktoren-Station -- machine-tractor station], and its culture-house, the locality forms the centrum of a farming district. Further to Seidingstadt, an old irregularly laid-out settlement originating in the first Franconian settlement period. It is mentioned in documents of the year 800 as Siduchestat, and is located there where the Kreck Valley begins to constrict. It has a glorious hunting ground and hunting lodge (today a home for the aged) of the former dukes of Hildburghausen. Now, via omnibus to Haldsburg.

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Special geological map of Hildburghausen and Rodach with annotations.

16. Heldburg -- Tonberg -- Colberg -- Urnerstadt -- Lindenau --
Heldburg -- Feste

This excursion leads through the higher levels of the Middle and Upper Keuper to the phonolitic Heldburg. The variegated Keuper marl and stonemarl beds are well exposed a few paces below the former railroad station of Heldburg. The morphology of the valley is quite simple: broad Kiesalluvionen. Heldburg is situated on a Pleistocene terrace; on both sides of the valley there are fertile fields with softly rising Lipsmergels (VII) and Keuper marls (km 4); escarpments in the zone of the harder sandstone benches: km 5 (Coburg building sandstone); in addition to the latter, there is km 7 (dolomitic arkose) on the left bank. From km 5 down, the so-characteristic oak-hornbeam forest as a rule begins. This forest is invariably rich in xeric varieties there where it covers Keuper lettes and marls, as on the Heldburg-Helling Plateau. On the other hand, the forest shows poor sand facies on sandy soils (km 7, 8), as on the Heldburg-Erlebach Plateau. One should cast a glance behind one! The marvelously compact view of Heldburg to the left; to the right the charming mountain castle on the woods-encircled, phonolitic volcanic dome.

Holocene calcareous tuff crops out in the small valley between Gerichtsberg and Kernleiten on the Wiesengraben. On the Heldburg-Colberg road there is an outcropping of Coburg freestone under the base of the road and in an abandoned stone quarry in which the variegated Keuper lettes and white sandstone beds of km 6 outcrop over the freestone bed. Here, due to being covered with woods, the arkose level does not manifest a favorable exposure. On the other hand, the castle sandstone, which forms a clear terrestrial level, is exposed in a stone quarry near the road.

The sandstone was used for mortar and room sand. There where the road dips (before km stone 25.3, forest stone B 3) there is an outcropping of the bright-red lettes of km 9. The two strongly filled-in ponds on the edge of the forest before Colberg attest to the spring level of this step. From here, a way leads over the bright red lettes of km 9, the equivalent of the South German zandlodants facies, upward to the Tonberg upon which there is an outcropping of the thickly-bedded, yellowish-white, Raet sandstone which here is alternately imbedded with dark grey, pure clays. The sandstone is valuable as a building material; the clays are processed in the Ummerstadt pottery works. The sandstone contains remains of charcoal; it was thus once vegetation-bearing (plant Raet). On the way, and further in a field way quite close to Colberg, there is an outcropping of Arkose sandstone and, thereabove, reddish-brown Lettenschiefer with dolomitic marl emplacements. The view toward the Eisfelder Bliess: situated in the Rodach Valley is Bad Colberg (locality on the Kolberg, as the Tonberg was once called; according to Jacob, perhaps after the "kohlenmeiler" [charcoal piles]. From the Gipsmergel warm mineral springs (containing magnesium sulfate, Glauber's salt, and sodium chloride) spring forth; these springs led to the building of the bath. In the Rodach Valley we wander downward toward Ummerstadt, an ancient, true Franconian village of 1,070 inhabitants. Much earlier it was a "Heldburg" in the possession of the state; before the separation it manifested the old Franconian field-distribution system (bands which ran from east to west through forest, "wonne," and meadow, originally manifesting winter crops, spring crops, vegetable fields, meadows, and fallow fields (according to Brueckner). The town plan shows a rectangular outline and rib-like street network. Tanning and pottery works have blossomed

since days of old in the little farming village. Still in the year 1850 sixteen pottery works existed here; these works exported a yearly 1,380 centners of earthenware. Today only one pottery works exists. In a field way which branches off on the right bank of the Ummerstadt-Erlebach road toward the south, there is an exposure of km 4. The topographic break of the Coburg free-stone (km 5) is remarkable; thereabove, km 6 with stonemarl beds crops out on the road. The plate here forms the arkose level (km 7) which outcrops several times in the limestone facies near the Erle Brook. The Erle Brook flows through this plate. Here is situated the estate (the Erle) which was redistributed to new farmers in the wake of the land reform. From the heights one enjoys a beautiful view of the fertile and spacious valleys of the Heldburger and Hollinger Kreck; in the background rises the basaltic Seilberg; to the left of the latter, the picturesquely-situated mountain church of Altenstein, visible far into the distance. In the region encompassed by Lindensau and Friedrichshall the grey-green Gipsmergel of the variegated Keuper marl level (km 4) is again greatly extended; issuing therefrom are the Friedrichshall bitterwater streams which today are being extensively filled in. Further on to Heldburg! The "little city in the 'Fleck'" -- Villa heldidberga (mentioned in documents dating back to 837) -- arose as a very old settlement at the foot of the glorious Burgberg, under the protection of the latter, as it were, in a location unfavorable for communication. It stretches out along the slowly-flowing creek, and is linked with the capital town of the Kreis by an omnibus line. It manifests only insignificant industrial development. It is a typical Franconian village with striking meadows and dense woods. In earlier times it had extensive vineyards; these have not been replaced by fruit orchards.

The village consists of the inner town, the upper section, and the lower section. The inner town was once encompassed by a wall with 14 towers and two gates; much of this wall still remains. The compact view of the village is crowned by the stately, picturesque town church (maintained in Gothic style) situated on a high-lying place. Worthy of mention are a number of structures of Franconian style (the Bastian Happach House of the year 1605 on the Obertor Street is the most picturesque and far and wide the most beautiful) and a beautiful town gate. From the footpath to the castle, an arrowpoints down to an old stone quarry in phonolite; this quarry's stone is quite informative. Steppe-heath and heath-woods fragments cover the phonolitic slope. There where the way links with a narrow path from the castle, a basalt dike intersects in its north-northeast strike the phonolite. The basalt outcrops in ditches.

Presumably originating from the Gau-Orfen period, the original castle arrangement of the Heldburg (the "Franconian jewel") was a stone house with a wall, a circular wall, and draw bridges. In the period 1558-63 the castle was renovated: the Heiden wing on the northeast side, the Kommandanten wing on the north side, and the French wing in the most noble Renaissance style on the south side. It was the administrative seat of the "Pflege Heldburg." In 1875 it was restored by George II. Recommended is a climbing of the tower, so that one can enjoy the extraordinarily beautiful panorama of the Thuringian-Franconian countryside. Toward the west: the spacious valleys of the creeks. Gellershausen lies at the confluence of the Westhaeuser, Leitenhaeuser, and Gompertshaeuser Creeks. The now strengthened Gellershaeuser Creek links with the Streufdorf Creek coming from the north-northwest at the foot of the Schlossberg. These valleys all lie in the

region of the fertile, variegated Keuper marl (km 4) and Gipsmergel. Rising between the creeks are terraced ridges of a relatively platy character. Their escarpments are formed by the Coburg freestone, the gypsum beds, and the quartzitic sandstone beds of the ζ -level in km 4. Whereas the marl of km 4 made possible ample cultivation, and the Holocene formations were converted into fertile meadows, the steep beds of Gipsmergel and gypsum are covered with either light heath woods or steppe heaths. On the other hand, the sand level, as well as the plate of the arkose sandstone (km 7) between the Streufdorfer and Westhaeuser Creeks are covered by either a still-original deciduous woods of the sand facies or a monotonous coniferous woods. In the plates, which are on the average 360 m high, we have before us the remains of the post-basaltic terrestrial surface which here is 100 to 110 m lower than in the region of the Muschelkalk of the Franconian swell. Visible behind Gellershausen in Gompertshausen; to the right, Schlechtsart and Leitenhausen; between the latter, the Spanshuegel (Spaehhuegel); the Ursula chapel southwest of Gompertshausen; between the chapel and Alsleben, the springs of the Franconian Saale; behind Gompertshausen, far on the horizon, the Kreuzberg; to the left, the Schwarze Berge; to the right, the heights or Plattenrhoen with the Wasserkuppe. Between Schlechtsart and the Grosser Gleichberg on the horizon one sees the twin mountains of the Hutsberg and the Neuberg.

Toward the north: before us, the valley of the Saar Brook with the village of Holzhausen and the Streufdorf Creek valley with Voelkershausen; in the background, one sees once again the old post-basaltic terrestrial surface upon which the basalt knobs of the two Gleichberge and the Straufhain are situated; therebehind,

the Franconian swell which can be seen extending from the St. Bernhard Plateau to the Hildburghausen Stadtberg and Krautberg. Between this swell and the leveled-off area in the Keuper one sees the Rodach Valley which opens toward the southeast. In the northwest is the basaltic, residual overthrust mountain -- the Dolmar; on the horizon, the Thuringian Forest.

Toward the east: between the Heldburger Creek and Rodach, the Heldburg-Erle Brook plate in a region partly of arkose sandstone, partly of castle sandstone km 8, with extensive mixed deciduous and coniferous forests. This plateau has its summit on the Tonberg near Colberg at 386 m, upon which mountain the bright-red Keuper lettes of km 9 (the equivalent of the South Germany zancloodonts lettes) and the yellow Haet sandstone with abundant clay laminations outcrop. The Franconian swell continues toward the east in the Werraaleiten and Lange Berge with the Sennigshoehe. Further to the east, the striking mountains of the Coburg region can be seen: Kulm near Moenchroeden, Feckheimer Berg, the geologically famous Kipfenberg, Feste Koburg, and Schloss Kallenberg. Under favorable weather conditions the Franconian Forest Kulm and, further, the Schneeberg and the Ochsenkopf of the Fichtelgebirge, are visible on the horizon.

Toward the southeast: the Franconian alpine meadow with the Banz cloister, Staffelberg, and the Glech castle.

Toward the south: we enjoy the view of the spacious valley of the Heldburger Creek with old settlements: Heldburg with its charming town plan, gate towers, and imposing town church; Einöd; Lindenau-Friedrichshall; Autenhausen and Gemuenda, where the creek empties into the Rodach. On the horizon: Altenstein with the mountain church which is visible from afar, the Hassberge, the basaltic Zeilberg and Bramberg.

The basaltic Hoehnberg rises in the southwest over the old leveled-off area represented by Heldburg and Hellingen.

From the castle, the apparent course of old stream channels of the post-basaltic terrestrial surface is easily made out (cf. sketch of river-valley fan in Figure 4 [of original]): an old river channel of the Urbiber which crossed in the Birkenfelder Pass near Hildburghausen the Franconian swell, flowed down in the direction of the Rodach of today, turned off toward Holzhausen, and in its western course, as Gombertshaeuser Brook and for a time as Leitenhaeuser Brook, flowed through the Leitenhaeuser Pass south of Spanshuegel and, further, west of the Rannunger Sammelrinne. According to J. Heims, it may even have flown in the direction of the present-day Baunach toward the southeast. A Schlechtsart river channel is also recognizable in the col between Spanshuegel and Kornberg. We can perhaps see in this col a continuation of those Urschleuse which crossed in the Leimriether Pass near Hildburghausen the Franconian swell and linked southwest of Trappstadt with another course of an Urschleuse -- the Bruennhof-Zeilfelder-Hochberg channel.

Geotectonically, the entire Keuper landscape represents a great trough between the two Hercynian coursing faults: the Gleichberg-Hassberg disturbance and the Hercynian-trending saddles: in the northeast Bibra Saddle and the eastern continuation: the saddle between Simmershausen and Streufdorf; in the southwest saddle on the Lederhecke and the Serrfeld Saddle. The axis of the Grabfeld trough likewise assumes a Hercynian course from the Grosser Gleichberg over the Gleicherswien to the Heldburg. The trough opens toward the southeast; its strata dip in the same direction, so that in this direction we attain every younger

strata (cf. the block diagram in Figure 2 [of original]). The river system corresponds to this trough structure. The Streufdorf-Heldburg Creek flows in the direction of the trough axis up to its emptying point into the Rodach. In an acute angle, the Westhaeuser, Leitenhaeuser, Gompertshauser, and Hellinger Creeks (from the right), and the Rodach (from the left) flow to this central vein.

Structural lines of the settlement: from the Main, through the valley of the Franconian Saale, and over the Gipsmergel of Alsleben, Trappstadt, and Gompershausen, warmth-adapted varieties which are here quite numerous made their way into the creek region. Via this same way, agriculture may have been brought into the local region by Neolithic man. Evidences of dispersed Alamannian waves of the first settlement period can perhaps be seen in Hellingen. On the other hand, most of the enclosed, irregularly laid-out villages, the names of which predominately terminate in the prefix "-hausen," are Franconian settlements which extend from the west into the old and young valleys.

Thus, from the venerable castle we enjoy the panoramic view manifesting the characteristic picture of the Franconian Keuper landscape: enclosed, irregularly laid-out villages in broad, fertile valleys with warm summers; field strips decorated in the most diverse colors; the terraced Keuper slopes; the glorious oak mixed forests of the plateaus; castles and ruins; former noble residences and palaces; baroque churches and chapels; and the friendly, hardy, true Franconian village of Heldburg below us, today as centuries ago an enclosed, virtually pure agricultural settlement.

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Special geological maps of Heldburg with annotations

17. From Heldburg to the Ursula Chapel, Trappstadt, and Simmershausen

This excursion leads through a pronounced arid region with abundant warmth-adapted flora.

On a field way over Pleistocene loams and gravels to Gellershausen. Near the first barns south of the village a down-faulted Liassic block has become stranded in both fragments of a basalt bed. This block has been preserved by the two resistant basaltic dikes from being excavated (remnant of denudation).

Gellershausen (Gilershusen in 1158; according to P. N., Gilaris) lies at the confluence of three creeks (westhaeuser, Leitenhaeuser, and Compertshauser) in the broad valley bottom of Gipsmergel and Keuper marl (km 4), which is here often well-exposed. On the field way from Gellershausen to Compertshauser we very quickly have the impression that here an old river channel flowed toward Compertshauser. It was presumably an Urbiber which will become quite clear to us, if, looking backward, on the other side of Gellershausen in the Holzhausen direction, we view the depression near the masts of the super power station. Two other depressions on both sides of the Spanshuegel apparently also indicate two old post-basaltic river channels: a Leitenhaeuser

and a Schlechtsarter channel. The south slopes of the Gipsmergelhügel between the creeks, Kilianshauk, Weinberg, and the Hainigshügel in particular, still manifest beautiful steppe heaths which are characterized by a number of Pontian and Mediterranean varieties: *Rosa gallica*, *R. pimpinellifolia*, *Aster linosyris*, *Artemisia campestris*, *Supleurum falcatum*, *Erysimum erysimoides* (= *odoratum*), *Euphorbia verrucosa*, *Filipendula hexapetala*, *Hippocrepis comosa*, *Lactuca perennis*, *Oxytropis pilosa*, *Peucedanum Cervaria*, *Physalis Alkekengi*, *Potentilla rubens*, *P. rupestris*, *Stachys rectus*, *Trifolium rubens*, *Veronica Teucrium*. (Region afforded natural protection).

Westhausen is the most important settlement of all the others in the region. It developed from the two Franconian settlements only after the Thirty Years' War. These two settlements are the higher-lying Hohenhausen and the Westhus (mentioned for the first time in documents of the year 776). (In this year and again in 813 noblemen gave estates to the Fulda cloister which sent its missionaries here in a quite early period. Fulda had a Kilian church built as the mother church of the Heldburg region. Due to its rich income, the church was made a part of the University of Wittenberg, which then assumed the duty of providing a parson.)

At the eastern egress of Gompertshausen (in 1119, Gumbertshusen; according to P. N., Gumprecht or Gumpert) on the Westhaeuser road there is quite remarkable exposure in km 4 with a basaltic dike which is embedded in an echelon arrangement (Figure 39). The lines in the sketch represent stonemarl beds. From a phytogeographical viewpoint, the reader's attention is directed toward the nearby, densely-vegetated Lachen woods which is characterized by the following

remarkable varieties: *Bupleurum longifolium*, *Euphorbia verrucosa*, *Filipendula hexapetala*, *Gentiana Pneumonanthe* (at the edge of the forest), *Inula hirta*, *Lathyrus niger*, *Melampyrum cristatum*, *Oxytropis pilosa*, *Potentilla alba*, *P. rubens*, *P. thuringiaca*, *Pulmonaria azurea*, *Sedum reflexum*, *Veronica spicata*, *Thesium linophyllum*. Near a picturesque old group of lindens at the southwest exit of the village, we take the "Kappelweg" to the Ursula chapel. A basaltic dike intersects the Compertshausen Flur, rising as a swell in a south-southwest, north-northeast line of strike as far as the valley of the Hellinger Creek. The small heights between this dike and the chapel way is also conditioned by a basaltic eruption (here stone-quarry operations are carried on). The Compertshausen river channel once flowed down toward the west over the watershed between Kreck and the Franconian Saale. Before the old border fortification we cross a basaltic dike which, however, does not manifest itself morphologically.

With respect to the landscape conditions: In the local fields of Compertshausen and Westhausen the drought damages have had a particularly adverse effect in the past years of drought. Nevertheless, these fields harbor steppe heaths and heath woods which have the greatest diversity of varieties. In the contiguous Bavarian region of Trappstadt, these heaths and woods experience a further increase of floristic composition. Near Compertshausen the improvement of the damp meadows on the Kreck was carried too far; consequently, the meadows produced dried-up and only insignificant yields. Hereby the groundwater level in the entire meadow land was sunk. Among the various cultivations of the landscape are poplar plantation (this is necessary); the plantation of many

thousands of fruit trees and hedges in the fields of Gompertshausen-Rieth which today are virtually lacking such; the storage pond for bringing irrigation to the haycrops. The variety-rich oak-hornbeam forests are afforded protection by the landscape.

On the narrow path we stop at the apex of the forest, in the forest walk along old valley soils, and then follow the way which leads through the forest up to the chapel. The Ursula chapel lies picturesquely on a wooded spur of the sandstone level (§) in km 4. An oak mixed forest of the sand facies with *Calluna vulgaris*, *Potentilla silvestris*, *Daschampsia flexuosa* covers the approximately 2-m-thick fine-grained sandstone which forms the plateau near the chapel. Unfortunately, the view is quite hampered by the vegetation. Situated in the caldronlike-broadened upper Saale Valley, where an entire series of small and the smallest side valleys enter, is Alsleben in the region of the very fertile Upper Gipsmergel. This village apparently originated in the initial settlement period. The Gipsmergel is characterized by a high content of limestone and gypsum and represents the cause of the later quite renowned fructiferousness of the Koenigshof Gau. Now, either down to the Saale Valley and further in the direction of Treppstadt, or over Sternberg with its manor house to the famous denudation remnant south of the Heckenmühle, where a basaltic dike suddenly swells 10 to 12 m high in a small hill and is characterized by xenoliths of baked Keuper marl, Keuper sandstone, and black, likewise-baked Posidonia shales with rich Liassic fauna (*Posidonomya Bronni*, *Inoceramus dubius*, *Belemnites acuaris*, *Ammonites communis*). Here we are afforded clear attestation that at the time of the basaltic eruption an approximately 300-m-thick sedimentary cover must have lain up to the

Liassic over the landscape as we see it today. Its fragments fell into the depths during the scoring of the crevices and were assimilated by the magma. Now past Alsleben to Trappstadt.

Ursula -- Trappstadt (Figure 40). From the chapel on the pilgrimage way, down over the marl level (km 4) which crops out here on the way. It is predominantly a case of reddish-brown lettes, lettenschiefer, and marl with quite weak sandstone beds which are only a few centimeters thick. Then follows the Lehrberg level in three stonemarl beds which in turn are separated by reddish-brown marl and lettenschiefer. The km 3 level, which is exposed again on the slope, also consists predominantly of reddish-brown marl and lettes. Springing forth in the extensive valley mouth is the Franconian Saale with its source brooks which are separated from each other by soft terrestrial waves of Schilfsandstein. On field ways, along ridges, over to the Altenburg near Trappstadt, over the Lehrberg level to the terrace of the ζ -level, which here again is orographically sharply delineated. In former days the pure alabaster gypsum of the γ VI zone below this sandstone terrace near the Altenburg was mined. The ζ -terrace is situated on the steeply-dipping, approximately 60-m-thick complex of Gipsmergel and gypsum beds γ VII, on the upper marl and stonemarl of km 4, and on the lowermost beds of the Coburg or Semionotus sandstone (km 5). A richly-varied vegetal cover corresponds to the manifold alternation of stone. Fruitful fields cover the lower Gipskeuper up to the Lehrberg zone: barley of excellent quality on the warm Gipsmergel; fodder crops and grain on the easily-disintegrating, fine-sandy, clayey, and thus moisture-retaining Schilfsandstein. Then following are a still quite original deciduous mixed forest, principally an oak mixed forest with which all the deciduous trees in the undergrowth form

a community. This forest manifests in the region of the ζ -level the poor sand facies which we have already seen on the plateau of the Ursula, whereas the forest of the warm-dry stonemarl and Gipsmergel (y VII) assumes the character of a heath woods, of necessity giving way to even the steppe heath on the sunny slope of the Altenburg. However, in both, the plant life is becoming increasingly more magnificent, beautiful, and abundant with respect to its warmth-adapted varieties (Pontian and Mediterranean), of which the following bear mentioning as the most characteristic plants of the warm-dry Gipskeuper: *Rosa dumetorum*, *R. gallica*, *R. glauca*, *R. Jundzillii*, *R. pimpinellifolia*, numerous bastard roses, *Sparganium longifolium*, *Dianthus Aimeria*, *Dictamnus albus*, *Filipendula hexapetala*, *Galium boreale*, *Geranium sanguineum*, *Lathyrus niger*, *Peucedanum Alsaticum*, *P. officinale*, *Potentilla alba*, *P. rupestris*, *Sedum reflexum*, *Veronica Teucrium*, *V. spicata*. From the Altenburg one enjoys a glorious view of the Keuper landscape and beyond. Here we shall mention only the opposite post-basaltic fluvial terrace on the Hochberg west of Trappstadt, where an Urschleuse has deposited Raet pebbles from the slope of the Grosser Gleichberg.

To Trappstadt which lies in Schilfsandstein which has numerous good exposures; then via the highway to Eicha and Alsenleben. From Trappstadt to Linden! To the right, the same terrace formation on the Altenburg and Spanshuegel as can be seen toward the valley of the Franconian Saale: Lehrberg terrace, sandstone terrace of the ζ -level, and the summit area in the Semionotus sandstone. Up to a small meadow valley one sees Schilfsandstein; on the other side, the variegated marl of km 3; the way which intersects manifests an excellent exposure of the stonemarl beds of the Lehrberg level. Further on, the variegated marl of km 4

outcrops on the way which we leave after a short while in order to enjoy from the S-level once again a magnificent total picture of a Keuper landscape: before us is the Franconian street-village of Linden on the terrace encompassed by the Lehrberg level (bearing Pleistocene sediments between Linden and Gleichwiesen). We find ourselves on the S-terrace; to the right before us is the steep slope of the Gipsmergel y VII leading to the leveled-off area in the marl level km 4 of the Kornberg. On the Hexenhuegel above Gleichwiesen there follows the level of Semionotus sandstone with the leveled-off area in km 6. At the foot of the Hexenhuegel, on the so-called Kuhberg, there is a wall-like uplift which has been caused by a basaltic dike. In the spacious valley the Milz flows slowly in a semicircle around the Grosser Gleichberg, encompassed by broad alluvial fills and taking up small side valleys which drain radially the Grosser Gleichberg, past to Roth, Simmershausen, Gleichwiesen, Hindfeld, and Milz. Terrace-shaped, the terrain also rises thereabove on the imposing high-lying area of the Grosser Gleichberg. Between Linden and Eiche, close to the highway, one sees a sharply-defined uplift, a Devil's Wall: the Einfahrtsberg which in turn was caused by a south-southwest and north-northeast striking basaltic dike. Geotectonically, the Keuper landscape represents a great trough, the bottom contour lines of which assume a Hercynian trend, as, for example, the axis of the Bibra Saddle and the Marisfeld trough, the Wiedersbach fault and the marginal crevasse of the Thuringian Forest. Situated in the axis of the Keuper trough are Grosser Gleichberg, the village of Gleichwiesen, Heldburg castle, Tonberg, et al. From this line the strata slope up toward the northeast trough edge in the direction of the Bibra Saddle and the upwarping between Streufdorf and Simmershausen; whereas it rises on the southwest flank to the saddle on the Lederhecke and that of the Serrfeld.

Now, to Linden! Southeast of the village there is another outcropping of two basaltic dikes near the bifurcate Linden-Haubinda, Linden-Schlechtsart: the one on the ditch running east of the bifurcate, the other on the Schlechtsart road. From an anthropogeographical viewpoint, it is to be mentioned that the village of Linden originated as a Franconian street-village, presumably in the post-Carolingian period. Behind every farmer's yard, a closed field strip ran parallelly with the next to the forest. Due to the distribution of hides, the farms are long and narrow. The houses, which have their gable sides situated toward the street, are not situated at right angles to the street, but obliquely, so that thereby a gradation of the houses is effected, giving each neighbor a view of the village street. Now, via Gleichewieser, back to Simmershausen and by omnibus to Hildburghausen.

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with annotations

18. Hildburghausen -- Bruenn -- Crock -- Eisfeld

This excursion leads through the Bunter sandstone region, over the Wiedersbach fault, to the mountain margin (Crock) and to Eisfeld.

On the Weitersroda road, on the slope under the garden of the sanitorium, there is an outcropping of finely-grained, platy, micaceous, dark Roeth sandstone which here contains the characteristic fossil of the lower Roeth -- *Myophoria costata*. The fractures in the *Chirotherium* sandstone near the Friedrichsanfang estate (also called a zoo, which existed here for a short time in the ducal-Hildburghausen period) have become historically famous. Here in 1834 the tracks of the *Chirotherium Barthi* were discovered. The plates, called "Hessberger plates" after the nearby mountain, found their way into all the greater collections of the world from these fractures. Sm 3 is a fine-grained, more or less brown or yellow-flaked stone (thus also called mottled sandstone) and is highly-valued as a building sandstone. The uppermost beds very often contain current marks and relief impressions of mud cracks, i. e., the fillings of former desiccation cracks. Frequently to be found between them are tracks of the Ch. B. (see Figure 41). According to the most recent views (Soergel, 1925), these *Chirotheria* were carnivorous, long-legged Reptilia. (The above-mentioned greatest track plates which are to be found in the paleontological homeland museum at Bedheim, i. e., plates of a size of 14 m³ from the Hildburghausen *Chirotherium* sandstone with 150 individual tracks, among which are tracks of at least 10 new species of Reptilia, were preserved in the proximity of the Hildburghausen swimming pool.) Located at the edge of the forest and afforded a great deal of protection in a valley head is Weitersroda (1478 called Weitersrod, i. e., clearing of the huntsman) with a former Hessbergian castle. In the village there is still indication of the outcropping of sm 2, the level of the coarse-grained Bunter sandstone -- a solid,

diversely-grained sandstone of red color. The pastoral village of Buerden (in 1338 called Burden, i. e., "bur" = house and "burida" = to the houses; it belonged to the cloister and later to the administration of Veilsdorf) lies at the confluence of two valleys, thus manifesting a projecting-spur location. The peasants' houses are for the most part constructed of slate and have their stall either under or behind the dwelling rooms. In the latter case, the stall is usually equipped with a Hennebergian bower on the entrance side. The sandy fields manifest forest soils; there where the fields are used for agriculture, it is predominantly a case of potatoes. The Middle Bunter sandstone is a pronounced pond landscape, and was even more so in earlier periods. Barren spots in the forest and the edges of forests are covered with Atlantic heaths (*Calluna vulgaris*). Now, through sm 1, which unfortunately is nowhere typically exposed on the road, to Bruenn. The latter is a stately, irregularly laid-out village on the Eisfeld-Schleusingen road. It is located on the Wellenkalk strike of the Wiedersbach fault, where the strata of sm, so, mu, and mm come together, and which here are traversed by Bruenn. Bruenn is the railroad station of the Eisfeld-Schoenbrunn branch rail line; thus, it was possible for industry (wood cutting, wire production, porcelain industry) to develop in addition to agriculture. From the village to the halting place and by rail to the wire plant. Here, the Wiedersbach fault extends through from the southeast to the northwest; cropping out on it are Schaumkalk and Upper Wellenkalk in inclination, i. e., with a strong dip toward the fault. We follow the Crocker road and observe the floral alternation: pebble flora behind us; calcareous flora beside us; steppe heaths in the facies of the Carlina

acaulis drift in which pinnate "Zwenke," "Schafschwingel," and "Koelerie" render the basic color. Attempts are still being made to wrest yields from the stony Wellenkalk: potatoes, oats, beets, and fodder clover.

Before us lies the Thuringian Forest, the Irmelsberg with the Crock church, and to the left of the latter the Priemaeusel. The terrain up to the main fault of the Thuringian Forest is again a Bunter sandstone region, predominantly of the Rhoet. The main fault of the Thuringian Forest runs from Meroelsrod to the Irmelsberg, from northwest to southeast, and strikes down from the Irmelsberg eastward to Schimrod. The thereby-projecting corner of the mountains, principally Priemaeusel, Irmelsberg, and the Crock community forest, consists of Rotliegendes of the Goldlauter level. To the northwest of Bruenn, on the Wiedersbach fault, lies Poppenwind ("the Wendish prisoners-of-war of a Hennebergian count called Poppo"); in the Bruenn Valley before the Priemaeusel lies Brattendorf [see Note below]; in the Rotliegendes lies Oberwind ("the Wends in the higher dwelling place"); before the Irmelsberg lies Crock.

([Note:] Dr. Jacob sees Slavic designations in the name of this village, as well as in the strange-sounding name of the mountain. In 1317 the village was called Bratndorf: Slavish "brat" or "bratr" = Bruder [brother]. The mountain Priemaeusel was named after the Slav P. N. Premysl; cf. the name of the Galician city which bears the same name.)

Beside the Crock-Bruenn road there is a bituminous mine dump; remains of this bituminous mining are also to be seen on the slope of the Irmelsberg on the Crock-Oberwind road. Here,

petrifacts can still be gathered: *Callipteris conferta*, *Pecopteris arborescens*, *Annularia longifolia*, *Calamiten*, silicified *Araucarioxylon*, and *Anthracosia*. Upper Bunter formations are imbedded on the main fault beside Rotliegendes formations (Goldlauter level). The slate, sand, and conglomerates of this level outcrop on the road, and the dip of these strata toward the northwest can be observed in the trench near the road. Geotectonically, the Rotliegendes represent a trough near Crock, the main axis of which runs from southeast to northwest. Its western edge coincides with the main fault of the mountains (Figure 43). On the field way near the church there is again an outcropping of the Goldlauter strata, together with the line of outcrop of the coal bed and the petrifact-rich clay shale which accompanies the strata.

The hanging wall: conglomeratic sandstone; 1 to 10 m of fossil-rich clay shale; 0.3-m-thick, dark limestone with traces of FeS_2 , PbS , and ZnS .

The coal bed: 2/3 to 1 m: above, slaty coal; then clay shale; below, paper coal.

The basal part: up to 100 m of conglomerates of grey color above; in between, arkose sandstone and red clay shale.

Between Irmelsberg and Oberwind the coal bed forms a small trough within the larger Crock Rotliegendes trough.

The decorative bilberry-beech forest of the Irmelsberg is situated on Goldlauter conglomerates which in turn form the basal part of the coal bed. On the south slope of the mountain there is an exposure of a stranded block of kaolin-rich middle Bunter sandstone. This block is bounded by faults. Here, the Lower Silurian,

which broadens on the other side of the Crock valley, attenuates. Here we see half-phylitic, half-clastic slate, i. e., in an argillitlike groundmass there is a thick accumulation of granules of grey quartz and whitish feldspar. The stone manifests minute folding. Now, halfway up the mountain, to the Crock mill, again over Goldlauter conglomerates, then toward the valley in the direction of Crock. At the cave below the mill there is again an outcropping of the Lower Silurian. Here the main fault manifests an excellent exposure. Upper Wellenkalk is imbedded beside Silurian. Here, it can clearly be seen that the old mountain core has not merely been raised against the piedmont, but has also been overthrust. Due to thrusting, the Wellenkalk was subjected to warping.

Crock, one of the oldest settlements of the upper Werra region (in 1152 called Cracte, which name means "throat" or "neck," in referenc to the location of the village before the narrow valley cut of the Weisse, according to Jacob), is located on the main fault (marginal crevasse) of the Thuringian forest, at the foot of an originally heathen -- later, Christian -- cultic establishment on the Irmelsberg where a pilgrimage church once stood at the sight of the present-day, still quite old, mountain church of the forest villages of the environs. (The name Irmin = Wodan, the "miraculous" Irmels spring on the mountain, and the designation Hain for the beech-covered Kirchberg are reminiscent of old Teutonic places of worship. The water of the Irmels spring is considered miraculous.) Here the Weissa enters from a narrow mountain valley in the upland-hill landscape; in the region of the Upper Bunter it has scoured out a spacious caldron which is encircled by Wellenkalk hills (Figure 44, block diagram of Crock). The Wellenkalk heights in the direction of Eisfeld bear Carlina;

nevertheless, even here, potatoes, beets, clover, and oats are still wrested from the stony soil. The heights in mu 2 represent a remnant of the post-basaltic terrestrial surface. Sporadically, Thuringian Forest gravels still lie about. The panorama afforded from the heights is quite rewarding: to the north, the mountain margin, which also coincides here, for the most part, with the forest limits. On the projecting spur of the Irmelsberg, the glorious mountain church; before the latter, in the spacious caldron, the village of Crock; to the east, the Sachsendorf caldron, as well as the Crock caldron in the Upper Bunter region. Hirschendorf has a location similar to that of Crock -- a pocket area -- near to the mountain margin at the point of issue of clear mountain water from the Slate Mountains. This village has abundant fruit plantations. Upon the somewhat boggy Roet meadow between Hirschendorf and Eisfeld a rare glacial relict -- *Gentiana verna* -- has been preserved in great quantity. The strictly continental summers since 1911 have abolished its sole habitat in Southern Thuringia. The Otto Ludwig city of Eisfeld lies in the southeast, before us, in the valley constriction and on the Wiedersbach fault. About 800 the old Franconian settlement was called Asifelde, i. e., "the field, the possessions, of Asl." The lower part of the town lies on the valley bottom on Werra gravels. Thereabove rises the old manor house on the Muschelkalk plate of the left bank of the Werra. The new part of the town grouped about this manor house. In 1323, through Berthold VII, the Marktort obtained the right to construct a wall, and in 1324 the municipal law of Schweinfurt. In its outline, the old part of the town manifests a ladder form (two longitudinal streets connected by three smaller streets). The main market is formed by the broadening of the main street in the new part of the town.

Among the many features of the town worthy of being visited are the Gothic town church -- the St. Nikolaus -- built in 1488; the parsonage, from the sixteenth century, with magnificent structural upper story; and the castle, formerly the widows' manor house of Hildburghausen duchesses, in which are housed today a model homeland museum and the archives of the town. The Otto Ludwig Association fosters in reverential duty the memory of the son of this town and the most significant poet of our homeland -- Otto Ludwig. The garden house and the garden were renovated, and from time to time the Otto Ludwig festivals take place here. As early as the Middle Ages, Eisfeld played an important role as a trade center for the upper Werra region, since it lay on two important trade routes on the Frauen road, which led from Erfurt via the Frauen Forest into the Schleuse Valley and further via Oberwind and Crock to Eisfeld, and on the Nuremberg road, which led from Erfurt, via Neustadt-on-the-Rennweg, Heubach, Waifenrod, Eisfeld, Schaikau, to Coburg. Still today Eisfeld is the centrum for the industrial hinterland of the "forest," as well as for the uppermost Werra region, and for the uppermost Schleuse region, which latter was linked to the main traffic artery in Eisfeld through the construction in 1890 of the branch railroad to Schoenorunn. The marginal railroad leads from Eisfeld to Sonneberg, thus encompassing the industrial town of 4,700 inhabitants, which also has doll and toy industries, in the great Sonneberg toy centrum. There where the Crock road links with the road coming from Bruenn, a greater bed of sandy clay of the Tertiary extends south and southwest of this bifurcation of the road. There is an exposure of this bed on a field way west of the town. All the roads which enter Eisfeld from the north and northwest lead through an extensive Pleistocene bed of Werra gravels from the Slate Mountains.

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19. The Schalkau Foreland of the Thuringian Forest

The excursion leads through the Goersdorf Rotliegendes
block to the Schaum castle, to Schalkau, to the Kalk plateau,
to Bless.

We find ourselves near the halting place of Goersdorf in
Middle Bunter sandstone (sm 1) which here is composed of looser,

easily-disintegrating sandstone with numerous pebbles. On the opposite slope of the rail line this stone level is well-exposed and covered by genuine sand flora: a pine forest with *Sarothamnus scoparius*, *Calluna vulgaris*, *Pteris acquilina*; and bog-moss communities on moist places which are underlain with clay. After we have crossed a narrow meadow valley in the direction of Goersdorf, we see another exposure of sm 1 on the heights before the village. Here it is rich in ironstone concretions and covered by the remains of a broom heath. Lower Bunter sandstone is well-exposed in stratification and color in the intersecting road which leads north between the first two houses. Covered over this exposure on the left slope is a broom heath with birches and willows. In contrast to the nearby villages in the forest-poor limestone and Keuper region, Goersdorf is still a village of forest peasants. The houses are built of slate, usually have the stall on the ground floor, but still manifest the Hennebergian-Franconian influence in the form of the bower (a linking together of the mountain and upland types, analogously to the manner in which mountain plants (montane element) and Franconian upland plants (colline element) link together in the sandstone region of the foreland). In the intersecting road which continues north of the town there is an Upper Rotliegendes conglomerate exposure which is separated from the Lower Rotliegendes conglomerate by calcareous binding material. The mountain north of Goersdorf received the name "Griess" from the gravels, pebbles, porphyry, quartzite, and phyllite which lie about here and which ultimately result from the Rotliegendes conglomerate. We proceed further on the way to Katzberg; before us we see red fields to the left, clayey and sandy soils of the upper level of the Rotliegendes. In the intersecting road which

branches off the Katzberg road and leads into the meadow field, there is an exposure of the Zechstein: lettenlike stone with dolomitic emplacements. A dolomitic block on the way shows the typical settlement of "limestone plants."

At the southeast foot of the Griess, at the turn-off point of the Katzberg road, Lower Bunter sandstone appears in the facies of red clay shale. Extending from the east is a steep Wellenkalk formation, the Stiefvater. The small valley between the Griess and the Stiefvater represents a tectonically marked valley. The approximate course of the brook runs over the fault. Both mountains are in sharp contrast with one another: silicate stone to the left, limestone to the right. The easier disintegration on the Griess conditions rounded forms, while the harder Wellenkalk stone on the Stiefvater conditions steeper forms. The fields on the Griess are red, those of the dolomitic Upper Bunter beds yellow, and those of the thereabove-imbedded Wellenkalk grey. Naturally the contrast in the vegetation of the soil is just as sharp: pebble flora (Calluna heath), limestone flora. The forests on the Griess correspond completely to the soil: a spruce mountain forest which flourishes; a pine forest is afforested on the Stiefvater, whereas a deciduous mixed forest would be more suitable, since originally it also existed here. The tectonic conditions of the Goersdorf fault are visible near the newly-excavated trough of a small side valley which comes down from the Stiefvater. The Goersdorf fault is split into two parallel faults, between which a small block of Zechstein and Upper Rotliegendes has become stranded. Now, over the saddle, not toward the Katzberg, but rather on the forest edge of the Stiefvater, which here again indicates the border of the Upper Bunter and Wellenkalk, to

Schaumberg! On the intersecting Schalkau-Katzberg road there is a good exposure of the red and green crumbling beds of the Lower Bunter, especially in rein channels. There where the footpath crosses the roadway to the Schaumberg, the calcareous, dolomitic beds of the Upper Bunter begin. Here the meter-thick *Myophoria* bed outcrops; its plates are filled with *Myophoria vulgaris*. The thereabove-imbedded Wellenkalk beds bear the ruins of the Schaumberg castle. A glorious picture is offered by the panorama of the landscape. A region manifesting great character lies before us. The block diagram in Figure 45 reproduces the geomorphological conditions, and the geological and tectonical conditions on the right side of the block. Before us the spacious synclinal valley of the Itz broadens in the Upper Bunter. It is flanked by the rather steeply ascending Wellenkalk formations, between which side valleys lead up to the Wellenkalk plateau, as does the main valley of the Itz. All these Wellenkalk formations are superficially planed down (table mountains) and represent the remnants of an originally great terrestrial leveled-off area, which we can also observe in the upper Werra Valley as post-basaltic areas, and in other places as well. It was the result of the excavations of waters in post-basaltic times. Thus, the landscape-forming forces, which finally led to a grading in the form of a leveled-off area or peneplane, had ceased in the post-basaltic period, at which time the erosion of the flowing water was again animated through upwarping in the terrestrial crust of the homeland. The stream channels of today were gradually formed; they began to sculpture the old terrestrial surface and to form the land formations of today. Toward the west, similar tectonic conditions are recurring, as in the little valley between the Griess and the Stiefvater. The Goersdorf fault leads from the afore-mentioned Zechstein block near Goersdorf

northward toward Katzberg, then turns suddenly toward the northwest, and runs via Heid, Steudach, Eisfeld, and Wiedersbach, to the Little Thuringian Forest. Lower Rotliegendes is embedded beside Upper Bunter formations or Upper Bunter sandstone. Above the Katzberg a block of Middle Bunter sandstone is bounded by smaller faults.

The end of the terrestrial surface in the Muschelkalk is the beginning escarpment of the Thuringian Forest. It is a rocky junction and artificial mountain-forest boundary. The various levels of the Muschelkalk are imbedded beside old rocks of the Paleozoic era: Lower Silurian phyllite, semiphyllite, and quartzite. Formerly, before the present-day valley formations of the mountains arose, the forest mountains also formed an articulated "peneplane." On the great or main fault, the entire Franconian foreland is sunk, or the mountain core has been upraised. This foreland was again worn down to a level terrestrial surface in the later post-basaltic period. We see before us the remnants of the latter in the "table mountains" of the Schalkau region. During the fracturing and the sinking of block in the Tertiary era a second great cleft or fault occurred -- the Goersdorf-Wiedersbach fault -- upon which the Goersdorf block sank, as is attested by the right ledge of the block.

The spacious Itz Valley is consecutively used by the two traffic lines: the Hildburghausen-Sonneberg highway which turns upward west of Bachfeld on the Wellenkalk massif, while the railroad avoids the steepness and courses in a great curve through the saddle pass between Katzberg and Heid. It is possible that in the early Teutonic era the spacious Itz Valley may have absorbed popular migrations. It is certain that in the

sixth century, migrations of Slavic people occurred up to the environs of present-day Schalkau. Slavic settlements of that era are Muerschnitz, Meilschnitz, Schierschnitz. According to Jacob, Slavic traces are still manifest in the villages of Doehlau and Welchendorf. On the other hand, those villages the names of which terminate in "-wind" are the settlements of captured Wends under the control of a Franconian manor lord of the ninth or tenth centuries, e. g., Gundelswind ("the Wends of Gundilo"), Almerswind ("the Wends of the Almar"). In the early Middle Ages the influence of the Banzgau extended to the Schaumberg castle in the Itz Valley.

The oldest settlements in the upper Itz region occurred in the spacious and fertile Upper Bunter trough of the Itz Valley. Younger settlements arose in a later era, partly at the boundary of two geological formations, principally Upper Bunter and Wellenkalk: Weitesfeld, Tossenthal, Gundelswind, Katzberg, Rhnes; partly on the two faults of the main fault: Stelzen, Mausendorf, Neuncoorf; and others on the Goersdorf fault: Goersdorf, Heid, Steudach, Eisfeld, et al.

Schalkau is an agricultural village which formerly lay in the old Banzgau. Later it was the ancestral seat of the Schaumberg castle. In 1362 it was given the rights of a city and market. Along with the localities of the environs, it forms a small toy centrum which is dependent on the greater toy centrum of the Kreis capital of Sonneberg.

From Bachfeld we wander up the Itz Valley which is a synclinal valley up to Tossenthal. Only here does its constriction into a V-shaped valley begin. Tossenthal manifests a number of quite characteristic slate-constructed, forest-peasant farmhouses

which in part still have their original structure and Hennebergian bowers. The name of the village indicates the earlier abundance of *Taxus baccata*. It is named after the "Tasbuk" mountain which is situated between Tossenthal and Sachsendorf ("Tas-" = yew, "-buk" = wooded height, according to Jacob). Now, via the old "Herren" road to Stelzen. To the left there is a good exposure of the Wellenkalk. Approximately 8-m-thick, levelly-stratified, grey limestone beds are located above yellow Upper Bunter dolomite. A harder bed, in which the *Lima lineata* frequently occurs in places, forms a clearly-recognizable level on the Wellenkalk slope. A second clearly-recognizable ledge is formed by the level of the *Terebratula* limestone, which level, like the Wellenkalk slope above the Upper Bunter with the first terrace, is wooded by a forest type which is characteristic of the Franconian Wellenkalk: the light, mossy "Fiederzwenken"-juniper-pine forest. There where the footpath, after crossing the old leveled-off area shortly before the village of Stelzen, reaches the cliff of the Itz, one can see remarkable tectonic disturbances on the turn-off point of the way between the outcropping Schaumkalk (x) and the place where the footpath turns off toward Mausendorf.

The Upper Wellenkalk is strongly folded. A block of Middle Muschelkalk, bounded by two faults and sunken as a "geological ditch," lies on the elevated area of the two uppermost horizons of the Lower Muschelkalk. Often to be seen near Stelzen are beautiful sink-hole formations, e. g., close to the old church, which can be traced to the leaching relief features and the collapse of the cave roof ("karst phenomenon"). Here Upper Wellenkalk is situated on the main fault beside Lower Silurian clay slate which is characterized by quartzitic emplacements. Not far from

the church is the spring of the Itz ("Mariahilf"), the Idis-aha (the brook of the Idisi, the divine battle maidens, the valkyria) in the cave about which sagas have been woven, where Gustav Freytag lays the beginning of his Ingraban. As is told by the people, the village received its name from the crutches ["Stelzen"] which the infirm, who sought cures in the "Mariahilf," left behind. From Stelzen we have a glorious longrange view of the peneplane which lies before, and far into the Franconian upland hills. The Muschelkalk fields lying directly before the mountain are abundantly covered with cliff debris of Lower Silurian slate and quartzite fragments. Even more magnificent is the view from the tower of the Blesberg of the morphology of the mountain and piedmont. In a wide circle in the mountains there is an exposure of the old leveled-off area of presumably Lower Silurian sub-jacent strata, channeled by erosional channels of the present-day, consequently-drained mountain brooks, the valley formations of which are at least visible from here: the Saar region between the Blesberg and Heuberg; behind the latter, the Fehrenbach Werra. The ascending columns of smoke behind the Simmersberg (mountain mill works) come from the Schoenbrunnen glass works in the Schleuse vicinity. Toward the east-northeast the old terrestrial surface rises above the Kieferle near Steinheid (867 m). Clearly recognizable toward the Crock is the boundary fault (east-west coursing) as an artificial mountain-forest limit. Before us to the southeast is the limestone plateau landscape of the Schalkau region with post-basaltic terrestrial leveling. Likewise belonging to the Upper Bunter and on all sides encircled by the Wellenkalk, the Sachsendorf fault pit in the Eisfeld fore-land corresponds to the spacious Itz region in the afore-mentioned plateau landscape. The Wellenkalk constriction near Eisfeld

indicates the here-coursing Wiedersbach foreland fault. Between the latter and the Franconian swell the Hildburghausen Bunter sandstone zone broadens out. In the southeast, between the Wiedersbach or Moenchroeden fault and the marginal fault of the mountain is the Neustadt-Sonneberg sand plain with the Mupperg as an outlier. Behind the Franconian swell is the Keuper landscape of the Grabfeld with the basaltic Gleichberge -- the Straufhain and the phonolitic Heldburg. Toward the west are the basalt mountains of the Dolmar, the Geba, the Hahnberg, and the Hohe Rhoen. Numerous gravel remains on the post-basaltic terrestrial leveling between Stelzen and Eisfeld indicate the trace of an old stream channel of the Werra, which flowed off near the present-day Harras toward the southwest toward Grattstadt.

Soil erosion on the Bless, according to my investigations of 1949 (cf. Schultze, Bodenerosion in Thueringen [Soil Erosion in Thuringia], 1952, Gotha): The steeply-rising Bless massif, which consists of Lower Silurian slate and fissured quartzite (cf. Figure 46), receives abundant precipitation: Saargrund, 540 m: 1,108 mm; Siegmundsburg, 784 m: 1,277 mm. In the presence of sudden thawing, soils freeze and high snowbanks occur (February 1946). In the presence of cloudbursts, mighty water masses with devastating soil erosion can occur on the Bless. The wanderer can follow either one or the other of the profiles investigated by me (Grotte Gesundbrunnen -- Leitenebene, Fliessental -- Leitebene; Bless tower -- Kirchweg from Mausendorf to Stelzen; Bless tower -- Finkenloch -- Saar). To be seen everywhere are sheet and fault erosion. The latter forms lined hollow molds which can become gorges (Itz, close above Stelzen). Firmly anchored heath vegetal covers were loosened by high water. In 1946 meter-deep holes appeared on the Stelzen Kirchweg. Near Schirnrod 2,000 m³ of

debris were deposited. I detected four erosional channels on a forest area 60 m broad. These were originally footpaths or trails by which long wood or firewood was brought down from the mountains; they were deepened by high water and were more or less concealed by debris. Often flat-rooted old spruces were subjected to the danger of having their root systems washed away, especially in the Fliessen Valley in which three grates were built. Since the carefully-carried out forest laws of 1555 a mixed forest (spruce, fir, beech, maple, elm), which was replenished until 1600, has existed here. Deforestation has occurred here since 1600, and spruce is being preferred more and more. It was especially preferred in the nineteenth century. Near the Gesund well there are remains of the primeval forest. In addition to the high-water damages of the same year, there was also the most dreadful storm catastrophe of 13-14 June 1946, when a low, advancing from the south, drew in northeastern cold-air masses, and heavy rains fell on the mountain and over the piedmont on the other side, whereas on the southwest side of the mountain a borallike storm resulted in "Windwurf" and "Sturmbruch." On deforested areas and windbreak slopes, spruces were uprooted, leaving holes in the ground, and there where the soil was softened a great deal, there was above all sheet-flood wash. Preventive measures: to make of the mixed forest a natural economic forest; deforestation, hay making, and clearing of tree roots on the slopes must cease.

Back to Stelzen and over the Stelzen mountain with gravel remains of an Urwerra to the Schwedenschanze. There where afforestation has not been carried out, the surficial Wellenkalk strata, which are crumbling into innumerable limestone fragments due to frost phenomena, resemble the northern "Alvarvegetation"

which is characteristic of the Silurian limestone rocks of Gothland and Oedland. Here, the so-called Alvar fragments (Kaiser, 1926, page 41 f.) are here as there composed of the same or similar types, e. g., "Schafschwingel" and characteristic terrestrial crust lichens. On the Schwedenschanze we cross the calcareous beds of the Upper Bunter, having before us to the left the spacious valley heads of a young erosion valley in the Upper Bunter. Whereas, from the look-out point, from which we enjoy a beautiful view of the Sachsendorf fault pit, the post-basaltic terrestrial leveled-off area, and the mountain, we notice that the Wellenkalk strata lie undisturbed, the latter manifest in the stone quarries on the Schwedenschanze a dipping toward the southwest, toward the Wiedersbach fault. Now, further on to Misfeld.

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20. Panorama Afforded by the Coburg Castle

The view from the venerable castle, the Franconian crown, is extensive and informative. We shall attempt to interpret geologically the "panorama" drawn by A. Bauer, encompassing the great structural lines and the most diverse landscape types (cf. Figure 1 [of original]: the geotectonic structural lines of Hennebergian Franconia).

Folio 1: In the direction of Brambergswald.

The Scheuerfeld plate (17) of the arkose level (km 7) is a remnant of the post-basaltic terrestrial surface which is also manifest in the heights near Witzmannsburg with a Liassic denudation remnant between the two great Franconian disturbance lines: the "Gleichberg" disturbance coming from Lichtenfels, and the Staffelstein or "Hassberg" disturbance coming from Goessweinstein.

Thus, this block, which is bounded by both disturbance systems, forms the direct continuation of the Grabfeld trough which dips from the Rhoeen toward the southeast, so that within this trough every younger strata appear toward the southeast (Figure 2 [of original]). Here, the uppermost Keuper strata are overlain by the Liassic. Vegetation-bearing Raet sandstone outcrops on the Tonberg near Bad Colberg (14) which lies in the axis of the Grabfeld trough. Before this mountain is the Rodach Valley which consequently drains the trough; behind it the basaltic Zeilberg (10). Once again we recognize the post-basaltic leveled-off area quite clearly in the Hohe Strasse (1) with the Altenstein church tower rising above it (2).

Folio 2: On the horizon, the Hassberge (1, 2, 3, 7, 8) and on Folio 11 (11, 12) therefore, a typical Keuper landscape, over which towers the phonolitic dome of the Heldburg castle, the jewel of Franconia. Before this castle, a great deciduous-forest region (Kesselberg Forest), for the most part of the arkose level. On another remnant of the latter is the Ursula chapel (10); to the right, before the Heldburg castle, the terrestrial surface is towered over by the Spanshuegel (Spaenhuegel). In the background, the basaltic Hohe Rhoeen from the Schwarze Berge

and the Kreuzberg to the Heidelberg (12, 15, 16, 17, 21, 24): great basaltic covers and residual covers which are located on the pre-basaltic leveled-off area and which form mighty plateaus in the Hochofen.

Folio 3: On the horizon, still the Hohe Rhoe: Wasserkuppe (2), et al. We see the Grabfeld trough as far as the Grosser Gleichberg (12) in which trough a narrow-gauge railroad links the village of Rodach with Coburg. A strip of Lower Keuper rests on the Muschelkalk of the Lauterberge and on the latter's broad Middle Keuper which rises to higher wooded levels in the Kallenberg Forest. The prosperous peasant settlements belong to the Ku and the marls of km. The proud emblems of the Grabfeld: the two basaltic knobs of the Gleichberge (12, 15); beside the latter, the basaltic Stielberg of the Dingsleben Nacken (26); and the knob of the Straufhain (caused by an extensive basaltic dike). Once again we see the Hohe Rhoe in the Ellenbogen (between the two Gleichberge). A new landscape picture appears on the horizon: the Vorrhoe with its characteristic cone-shaped basaltic mountains: Diesburg (27), Hohe Geba (29), Umpfen (31), Dolmar (4). The Franconian swell (Muschelkalk), the continuation of the Lange Berge, appears in the Hildburghausen Stadtberg (37, 38).

Folio 4: The Muschelkalk zone of the Lange Berge with the Sebnitzhoehe and the Alexandrinen tower (16) (post-basaltic leveled-off area), with Muschelkalk settlements in a pocket area (valley head of the Rodosus marl): Miersdorf (10), Ottowind (7), Ahlstedt (4). On the horizon, the chain of the Thuringian Forest: porphyritic residual overthrust mountains of the Rotliegendes era: Beerberg (22), Finsterberg (24), Hohe Wart (26); Simmersberg (31) of Lower Silurian phyllite.

Folio 5: View of the Lauter Valley: Unterlauter (5) on km 1; Oberlauter (6) on the boundary between ku and mo 2; between Oberlauter and Tiefenlauter, mm-mu 1. The Lauter Valley is used by the Werra rail line; to the left (from where we stand), the Lauterberge which consist of Muschelkalk.

The high-lying areas (which the arrow in Folio 5 intersects) belong to the Schalkau Muschelkalk plateau and represent very well the post-basaltic terrestrial surface in the region of the Muschelkalk. Above the latter rises the Thuringian Slate Mountains: Heuberg (12), Bless (14), Luerre Fichte (19), Blossberg (22), and the Petersburg (characterized by auriferous Lower Silurian quartzite) near Steinheid (23), all of which belong to the Schwarzburg saddle and manifest the pre-basaltic leveled-off areas. The great marginal fault of the mountains, upon which lower Silurian is embedded beside Muschelkalk, intersects the villages of Stelzen (13) and Mausendorf (15).

Folio 6: Before us, the spacious Itz Valley with extensive Pleistocene formations on the right bank. By the bend of this valley lies Oeslau (31), and, further on, Schloss Rosenau (33), Unterwolsbach (31), and the Lauterburg (3). Here, the Moenchroeden fault, coming from Kulmbach, crosses the Itz Valley. In a bayonet-like course in a Hercynian direction, it runs past the Muschelkalk zone which lies opposite the Lauterberge, toward Goersdorf and further, as the Wiedersbach fault, toward Eisfeld and Schleusingen. The round mountain forms between Itz and Roethen belong to the Bunter sandstone region. In the background, the mountain knobs of the Thuringian Slate Mountains which were more or less leveled-off in the Tertiary period: Grosser Mittelberg (4); the Kulm; the Silurian Fallberg (18) with its world-famous pencil-slate

quarries; the Tierberg (19) consisting of Devonian slate; the Muehlberg (21) consisting of Upper Devonian and Lower Carboniferous; Schleifenberg (27); and the high-lying Neufang (the latter two belong to the Carboniferous). The Slate Mountains represented on Folios 6 and 7 are a geotectonic part of the great Ziegenrueck trough: on Folios 7: 1, 2, 3, 5, 7, 18.

Folio 7: Before us, a part of the Linder plain, the great excavated region with the residual mountain of the Mupperg between Neustadt and Oberlind (16). It lies between the Slate Mountains and the Muschelkalk residual knobs on the Moenchroeden fault: Kemmter Berg (20), Stiefvater (22), Fechheimer Berg (28) and further on Folio 8: Flestener Spitzberg (7), Weinberg (19), and Guebel (28). The depression pit near Stockheim belongs to one of the three kotliegenden excavated zones in the middle of the Carboniferous.

Folio 8: The Brandenstein plain of the arkose level km 7 (29) and the Oarnstaedt Jurassic block represent additional remnants of the post-basaltic terrestrial surface. In the background, Doebraberg (3) of the Franconian Forest Devonian; the granitic mountains of the Fichtelgebirge: Waldstein (22) and Rudolfstein (27); and, on Folio 9, Schneeberg (3) and Ochsenkopf (5).

Folio 9: Fichtelgebirge and the northernmost spur of the Franconian Jurassic: the Main Valley and the Rodach Valley. In the foreground between the Kulmbach and Lichtenfels fault, the Juraberge which lie in the angle between Main and Rodach: Ebnetter Berg (35), the heights near Hain (36), and (before the Schneeberg) the Willenberg (37). In the Main Valley we see the

following: Altenkundstadt (28), Burgkundstadt (30), and Hochstadt (26). On the left bank of the Main is the sharply-marked table mountain of the Cordigast (19).

Folio 10: the Main Valley (20 and 9) with the Jurassic landscape. Juravorberge: Krappenberg, Eulenberg (1), the old Staffelberg (21), Wierzehnheiligen (29), Spitzberg (24), Romannstal (25). The part of the actually northerly Franconian Jurassic which lies between the two Hercynian-striking faults (the Lichtenfels and the Staffelstein): Gorkum (13), Schlockenstein (14), Kemitzenstein (15), Buchenrangen (16), and the plateau settlement of Lahm (12).

Folio 11: The Itz Valley with the Banzer Berge between Itz and Main (6, 7, 8, 11, 15) and the Staffelberg: Itz settlements: 16-23, 25.

Folio 12: In the direction of Hasswald. Above the castle and village of Ahorn (12 and 13) in km 5, above the post-basaltic leveled-off area of the arkose level in km 7, above Hohenstein (9), to the Buerger Forest near Sesslach (24) between the two great disturbances (cf. Figure 1 [of original], Lichtenstein forest between Ummersstadt, Rodach, and Baunach, Hasswald southwest of Ebern (17), where everywhere a Liassic residual block rests upon k6. The Zabelstein (21) near Hassfurt.

In regard to anthropogeographical structural lines, compare what is said of the Mupperg tower. Here, we shall only point out the topographical situation of Coburg. The oldest settlement was the fortification erected for defense against the Slavs. It was erected at the confluence of four river valleys, where in old

times roads intersected. The settlement of Trufolstat arose under the protection of this castle. When the roads developed more and more into important trade routes which sustained traffic between Nuremberg and Erfurt, as well as via Rodach, Hildburghausen, Oberhof, Schalkau, Eisfeld, Neustadt-on-the-Rennsteig, Sonneberg, Neufang, and between Nuremberg and Leipzig on the old Juden road which led via Koeppelsdorf to Saalfeld, a greater municipal settlement arose. This settlement enveloped Trufolstat. Manifest in the planned town plan are the circular shape of its inner walled area, as well as the great market from which four main streets egressed. This oldest town settlement was apparently the result of the founding of the Saalfeld Benedictine abbey. Under the Hennebergs (thirteenth century) the Coburg became a capital town; after 1353, under the Wettiners, it became the capital of the "region in Franconia." In addition to the princely Renaissance structures, there are beautiful peasant structures with tasteful Renaissance oriels, and picturesque gates and towers. A beautiful park extends from the Hofgarten up to the castle. Located on the Festungsberg is the richly-arranged museum of natural science. For centuries Coburg was historically and culturally bound with Thuringia and especially South Thuringia, so that, economically and culturally united with the Kreise of Sonneberg and Hildburghausen, a strong union was represented when the Land of Coburg was attached to Bavaria in 1920.

21. From Rauenstein to Sonneberg, and on the Mupberg [see Note]

([Note:] I undertook with rector Hopf, dec., of Forschengereuth, the Sonneberg-Forschengereuth excursion, and with commercial-school director Kunze, dec., of Sonneberg, the Neuhaus-Buergless excursion. I am indebted to both these gentlemen for valuable suggestions.)

The excursion leads along the mountain margin to Sonneberg, Neuhaus -- Schierschnitz, to the Mupperb with its long-range view.

There where two small cross valleys intersect the marginal fault of the Slate Mountains, at the feet of the sole castle, the picturesquely-situated mountain church, and the enlarged castle chapel, lies Rauenstein on a spring-rich fault cleft, in a wind-protected nest area, at the linking point of mountain and piedmont with the thereby-conditioned, diverse industrial possibilities -- forest and field -- where, in addition to inextensive agriculture, wood, toy, and porcelain industry developed in early time (today, household utensils, sanitary equipment, armatures). As early as 1783 the abundant wood of the mountains and the nearby kaolin sand of Steinheid made possible the founding of one of the oldest porcelain factories of the Thuringian Forest. To a great extent, the marginal rail line Bisfeld-Sonneberg has linked the industrially-active village to the communication network. Near the railroad station there is a good exposure of Lower Wellenkalk. Now, over the Muschelkalk plateau not far from the main fault, along the Lower Silurian Slate Mountains. The localities which we encounter are all more or less situated in nest areas: Meschenbach, an irregularly laid-out village on an old pilgrimage way to Stelzen, situated close to the marginal fault, with rather extensive fields belonging to the fertile marl of mm, with the Zinselhoehle in the crevassed Upper Wellenkalk (160 m long, traversed by a water-rich cave brook, with drip-stone formation, for the first time -- and strikingly -- described by the famous Coburg physician Johann Sebastian Albrecht (1728); Rabenaessif (one should note here the typical block or "Schrothaus" of the

mountain, encased in slate), as is Fichtach, is located in mm, whereas Melchersberg belongs to the marl of the mo. More concealed is Hohetanne, there where the east flank of the Schwarzburg saddle dips on the main fault; the latter leads along the Silurian as far as Mengersgereuth. Lower Silurian slate crops out in the intersecting road which leads on to the Birkenberg. From here to the plateau margin, where there is an exposure of Schaumkalk in a stone quarry and where *Myophoria orbicularis* can be gathered in the form of plates. Mengersgereuth is a village from the main clearing period and is situated on an old gravel terrace of the Elffelder, on the marginal crevasse where Silurian and Devonian link with the Muschelkalk of the foreland. In order to gather graptolites from a classical exposure, one should proceed a short way into the mountains. Near House No 133a in Raemern, the lower graptolite shale of the Gotlandian is well-exposed. Located in the greater community of Raemern-Mengersgereuth is the centrum of the production of the most diverse toy vessels (canoes, lifeboats, skiffs, ship types of the merchant marine and navy). Now back, and on the other side of the Elffelder Valley, to the railroad excavation near the Kleinmuehle between Mengersgereuth and Forschengereuth. Lower Middle Devonian, in the form of a saddle, is exposed within the Ziegenrueck trough on the mountain wall. The formation consists of tentaculite-rich calcareous, nodular slate. Here, the calcareous nodules attain the size of cigars. The main fault intersects the railroad excavation; there is an outcropping of sm on the opposite-lying sloping wall. At the war memorial above Forschengereuth there is soft Middle Devonian slate; along the steep mountain path there are exposures of *Cypridina* shale which is filled to the utmost with *Cypridina serratostrata*, and on the other hand bear the

rarer *Posidonomya venusta*. From the forest margin above Forschengereuth we enjoy a very instructive view. We find ourselves on the marginal fault: behind us are the Thuringian Slate Mountains; before us, the Mesozoic blockland of Franconia. About 200 paces before us there is an outcropping of nonfossiliferous Carboniferous slate in the ditch along a field way; between Forschengereuth and Mengersgereuth, there is Devonian; between Mengersgereuth, Hohetanne, and further west, there are Silurian formations in various levels. West of the Schichtshoehn-Taubelsberg line, the foreland consists of Muschelkalk; east thereof, of sm which lies as much as 40 m higher than the Wellenkalk of the Taubelsberg and Goerzenberg in the Isaak [see Note following]. ([Note:] Isaak or Isack, which lies before us: its name is a corruption of Nieshaugk = Nutzhuegel.) Thus, the afore-mentioned southwest line represents a fault line, upon which block faulting of the Triassic strata has occurred. The Sonneberg-Neustadt basin appears as a great excavated area with the Mupparg as a residual mountain, over which the post-basaltic leveled-off area once ran, an area which is still present in still greater extent in the richly sculptured and crumbling Schalkau plateau. Forschengereuth manifests anthropogeographical factors which are similar to those of the afore-mentioned marginal localities. Only it lies in the Middle and Lower Bunter sandstone and is a round-type, irregularly laid-out village. Nevertheless, it is not a Slavic but a thoroughly Franconian settlement from the clearing period (Forstengereuth). Old fluvial gravels of the Elfelder southwest of Forschengereuth clearly attest that this river once consequently drained the extended part of its upper course toward the southeast, and flowed toward the Steinach-Roethen. However, on the younger leveled-off area

it experienced a bend toward the Itz, as is attested by its old fluvial gravels southwest of Mengersgereuth and on the Goerzenberg. In the railroad excavation southeast of Forschengereuth there is an exposure of sm 3 in the form of a saddle. As ascent of sm 3 is also to be observed there where the upper Sonneberg road crosses the railroad. It is the sandstone complex which rises between the Schichthoehn-Taubelsberg fault on the one side, and the Steinach-Schierschnitz fault on the other. *Sambucus Ebulus* occurs in masses on the mountain slope near the railroad embankment between Forschengereuth and Bettelhecken, and near the forest recuperation home of the town of Sonneberg. Before us, the Teufelsgraben is a good example of an erosional canyon with all the relevant small formations, step formations, and retrogressive erosion in the harder sandstone beds. Now, via the Scharfenteich bridge, up to the railroad beds in which sm 2 with diagonal bedding is clearly recognizable in the direction of Forschengereuth. Here also the vegetal cover is characteristic: *Sarothamnium scopariae* (broom heath) with *Epilobium angustifolium*, *Betula verrucosa*, and the implanted *Robinia*. Exposed in the railroad excavation near Bettelhecken and in the sand pit located before the latter is the sm 1 level: looser sandstone with gravels and diagonal bedding. Here also an ascent of the strata is to be observed at the rail bend on the Eichberg. Easily recognizable behind the Sonneberg Society house is the bedding of the sandstone strata toward the marginal fault. Here these strata dip a bit toward the main fault of the Thuringian Slate Mountains, i. e., toward the northeast. The Kreis capital of Sonneberg, consisting of two settlements, is also one of the series of villages which are located at the transition point of the Slate Mountains to the Triassic piedmont. The northern town

part (Roten) arose in the narrow valley of the Roethen between Schlossberg and Stadtberg under the protection of the castle of the family of Someberg which was built around 1200 on the Schlossberg. It is thus called also "Roten on the Sumbg," and is presumably a filial settlement of an old clearing originating in the Carolingian epoch. The southern town part broadens with a pable-shaped outline toward the Linder plain (the right of a city was apparently granted by Jutta von Henneberg in 1439). After 1383 the name Sonnenberg appeared. The old Erfurt road (highway via Neufang) led through Sonneberg; at a distance of 2 km the Nuremberg-Leipzig protected road led by. Between the railroad station and the lower market a new town part arose at a checkerboardlike location. The stately structures at the railroad station, warehouses, the local sick-fund building, and the new town hall symbolize the character of the industrial town. The following are principally represented: toy, doll, and mask making in numerous enterprises; clothing, leather-goods, printing, paper, cardboard, and carton production; wood industry; renowned pedagogical workshops; and many other industries. A visit to the homeland and toy museum is recommended. Now, to the market with the administrative buildings of the town and the Kreis, and then up to the Schlossberg with the settlements of the postwar period. From the heights one enjoys a glorious view of the city which pours cornucopialike from the mountains and extends broadly into the plain. The town has already incorporated Bettelhecken in the west and the market place of Oberlind in the southeast, as has been the case with the double community of Koepfelsdorf and Huetsteinach. The present population of Sonneberg is 30,000. The imposing Mupperg with the town of Neustadt rises from the Linder plain; to the left we see the Steinach Valley with Oberlind and

Unterlind, Heubisch, and the village of Mupperg. Now, from Sommerberg, via rail to Neuhaus-Schierschnitz (in 1071, Nyhausen; later, Newenhaus). On the way from the railroad station to the factory, to the left in the ditch along the road, there is an exposure of the uppermost Rotliegendes (Tambach level): red sandstone in folds and contortions. The Schlackenhuigel on the highway are the final remains of a work of the "Neuhaus Railroad Company" with four blast furnaces and a rolling and casting mill near the Neuhaus-Stockheim coal mines (founded in 1845 by the enterprising Hildburghausen bibliograph and economic leader, 48er Joseph Meyer). He had borings done and shafts sunk. The existence of coal was ascertained. After 1754 an up to 60-m-thick Rotliegendes bituminous seam (ru on the geological map, rather than sto¹), located between Neuhaus and Stockheim on the Spitzberg not far from the Land boundary, was mined. Impure glance coal and pure coal of high calorific value were mined. According to the plans of Joseph Meyer and Friedrich List, the "Hanseatic-South Germany Central Railroad" was to have led via Neuhaus to Coburg. However, in 1848 trade and commerce came to a standstill, so that the uneasy investors withdrew their capital. Bankruptcy was inevitable. Another large undertaking took the place of the Meyer enterprise. The highly-valued kaolinitic quartz sand on the Biene near Neuhaus induced the founding of a great porcelain factory which produces electrotechnical porcelain. The former manorial estate was divided among the peasants. The road up the mountain leads through Rotliegendes sandstone, conglomeritic beds, partly with great feldspar-bearing porphyry. Easily observable from the heights is the falling of lettes and limestone from the mountain (cf. also the profile in Figure 47). Exposure on the Buergless: originally red, later bleached-out, sandstone (so-called Weissliegendes). There where there are bushes,

Zechstein overlies the sandstone. This Zechstein, at its lowermost parts, is from 5 to 15 cm thick, bitumen-rich, inextensively malchite-bearing dolomite, which can be regarded as representative of the Keuper landscape. Thereabove is dolomitic limestone. Clearly recognizable from the heights of the Buerglass, on the other side of the village of Neuhaus are two ground waves of which one consists of Zechstein dolomite, while the other consists of the afore-mentioned calcareous nodules of the uppermost Rotliegendes. On the southwest slope there is a good exposure of Zechstein lettes, in which *Productus horridus* can be gathered. Platy dolomite also outcrops here in the stone quarry. On the Buerglass-Lindenberg field way we cross honeycomb slate (su 1), fine-grained sandstone (su 2 and sm 1). The marginal flexure intersects between su 2 and sm 1; here, sm 1 is overthrust on the older stratum (cf. profile in Figure 47).

From the Mupperg tower we enjoy a beautiful and informative panorama of the tectonically, geomorphologically, anthropogeographically, and biogeographically interesting landscape. Now, by rail to Neustadt-on-the-Heath.

The excursion to the Mupperb leads through the three levels of Middle Bunter sandstone, which are well-exposed on the road: sm 1 looser sandstone with gravels, sm 2 coarse-grained sandstone, sm 3 fine-grained sandstone. The vegetation is of the gravel type: heath-pine forests in bare and moss-rich variants, whereby now *Erica vulgaris*, now red whortleberry, now bilberry prevails. Appearing among the true gravel plants are *Aira flexuosa*, *Sarothamnus scoparius*, *Molinia coerulea*. Beech, birch, and oak have also penetrated.

Geographical panorama from the Mupperg: By consulting the panorama guide on the tower we enjoy a very instructive view, seeking to establish the geographical structural lines in the development of this landscape picture. The southeast-northwest trending Slate Mountains manifest in their geological structure three great anticlinal uplifts with two great troughs from the Varistian folding period of the Carboniferous which lie between the uplifts, viz., the Lower Silurian phyllite saddle, the great Kulm or Ziegenrueck trough; further east, the gneiss saddle of Muenchberg; and a final "Einmuldung" between the latter and the Fichtelgebirge, still visible from the Mupperg (cf. Figure 1 [of original]). The rock limits between the Paleozoic rock and the Franconian Triassic foreland are almost without exception indicated by the artificial mountain-forest boundary. The direct foreland consists of two basically different landscape units: the richly-jagged and sculptured Schalkau Muschelkalk plateau and the Sonneberg basin (bounded by the afore-mentioned fault) of the Middle Bunter sandstone level. The upward compression of the Varistian peneplane and the great tectonic disturbances, the afore-mentioned faults, and the flexure on the Buerglass occurred in the Cretaceous-Tertiary period. Still in the pre-basaltic period, the Eogeneic degradation led to a terrestrial shallowing which is to an extent still in evidence in the Slate Mountains. Only then did a down-sinking of the Franconian swell occur and, simultaneously, a rising of the Sonneberg partial block. Again, a post-basaltic degradation, conditioned by these block faultings, led to a terrestrial leveling in the foreland, which is still in evidence in the Schalkau plateau and in the plate of the Mupperg. A third degradation phase which is still present today was caused by the

mighty work of excavating forces in the Sonneberg basin: that which once had been raised, so that the sandstone on the Isaak was able to attain greater heights than the Wellenkalk on the Goerzenberg, was extensively excavated through Steinach and Roethen. The Roethen was once a tributary of the Steinach, for old Roethen gravels lay on the terrace between Sonneberg and the Mupperg, but no longer below Neustadt. An older river channel, which corresponds approximately to the lower course of the Roethen of today, tapped in the old alluvial epoch the upper course of the Roethen near the present-day Hoen Brook. The upper course of the Roethen was a tributary of the Steinach up to the latter brook. Thus, the softer sandstone block was excavated by the Steinach and the Roethen up to the denudation relict of the Mupperg, over whose residual plate of the post-basaltic leveled-off area an Ursteinach flowed and has left its gravels here, according to Dr. Heim. Linked to the Sonneberg basin in the east is the region of the three Rotliegenden troughs, which in the area of the more easily destructible Rotliegenden rock in turn represents an excavated area in contrast to the harder imbedded slates (cf. the profile in Figure 47). Becoming visible in the west behind the Itz-Roethen watershed are the Kalkberge of the Lauter Valley; further west, the Sennigshoehe, the Alexandrinen tower of which is visible in the direction of the col between the two Gleichberg. Rising from the Keuper landscape of the Grabfeld, in addition to these twin mountains, are also the phonolitic knob of the Heldburg and the basaltic knob of the Straufhain. Once again appearing in the south in a fault running almost parallelly to the main fault of the Slate Mountains (the Kulmbach-Muenchroeden or Wiedersbach fault) are Muschelkalk mountains: Kemmater Berg, Stiefvater, Fechheimer Berg, Wasunger

Berg, Plestener Berg, and Spitzberg. Leaning against the latter at places in the Coburg region up to the level of ferruginous sandstone of the Dogger -- a level which is surrounded by the Keuper -- is a Jurassic block. We perceive the Coburg castle which lies on one of these Keuper heights (km 7). Further toward the south, we see the Franconian Alb with the Staffelberg and the towers of Banz and Wierzehnheiligen (cf. the profile of Lichtenfels and the Thuringian Forest in Figure 48). From a biogeographical viewpoint, the differences in stones manifest sharp contrasts. The Muschelkalk of the Schaalkau Plateau of the Kalkberge on the Moenchroeden fault, and of the Lauter Valley is characterized by steep S-shaped places and arid, high-lying plains with steppelike climatic features. However, approaching the mountains, the amount of precipitation increases, in contrast to the Muschelkalk region of the upper Werra. The Wallenkalk slopes and stony plateau areas, to the extent that they are not afforested, are covered by steppe heath and heath-wood-like stands: "Schafschwingel" and "Fiederzwenken" fields, sloe and juniper drifts with only a few Pontian and Mediterranean varieties, e. g., *Hippocrepis comosa*; *Anemone Pulsatilla* and *vilvestris*; *Bupleurum falcatum*; *Orchis ustulatus*; *O. sambucinus*; and, on the Guebel, *Loroglossum hircinum*. In the south, west, and east, snail types have only taken root on the sunny limestone steppe (cf. Figure 16 [of original]). The low-lying Bunter sandstone plain of Neustadt, which has an extraordinary tendency to form moors due to water-impermeable clay beds, and which facilitates the formation of ponds, is damp and cool and thus manifests oceanic climatic characteristics. In the year 1885, 147 larger and smaller ponds existed within the parish of Neustadt; today there are only 25. In 1885 there were

still a hundred standing bodies of water within the parsonage of Mupberg. Almost without exception, northern or sub-Atlantic varieties took root on the Bunter sandstone region. We shall mention here only the most remarkable types of this landscape:

1. Northern types: *Lycopodium annotinum*, *clavatum*, *complanatum*, *Hlechnum Spicant*, *Coeloglossum viride*, *Drosera rotundifolia*, *Malaxis paludosa*, *Menyanthes trifoliata*, *Listera cordata* (very rare), *Vaccinium Oxycoccus*, *Dryopteris Thelipteris*, *Dryopteris montana*, *Eriophorum latifolium*, *E. angustifolium*, *Calla palustris*, *Spergularia rubra*, *Ornithopus perpusillus*, *Jasione montana*, *Salix repens*, *Gypsophila muralis*.

2. Northern-montane types: *Lycopodium Selago*, *Trientalis europaea* (northern-montane to sub-Arctic), *Vaccinium uliginosum*, *Crepis mollis*, *Arnica montana*, *Petasites albus*, *Meum athamanticum*, *Trifolium spadiceum*, *Chaerophyllum hirsutum* (Central European-montane).

3. Sub-Atlantic types: *Lysimachia nemorum* (Mailschritz), *Digitalis purpurea* (Isask, Moenchroeden), *Erica Tetralix* (only in a few places), *Lycopodium inundatum*, *Hypericum pulchrum*, *Saxothamnus scoparius*, *Calluna vulgaris* (European with Atlantic main distribution), *Galium saxatile*, *Centaurea nigra*.

Due to this cool-damp climate, there are only a few evidences of the Pleistocene period (glacial relicts) of the animal and vegetable kingdoms: *Planaria alpina* and *Polycelis cornuta* in cold springs and source brooks of the northern sand region; *Vertigo substriata* near Weissenbrunn and Almerswind (according to Brueckner); the plant relict *Gentiana verna* near Steinach (Sommerberg Kreis).

From a zoogeographical standpoint, the abundant bird life of the Neustadt plain is quite remarkable. Its most diverse biotopes: High moorlands, sandy heaths, small wooded fields, numerous ponds and water-filled ditches, as well as the "Kultursteppe," which increases more and more through draining, were once a bird paradise of the homeland -- when the number of reflecting water surfaces was greater than today -- and still today they are a preferred habitat of rare guests. According to Brueckner (1926), the Hoenbach pond is the locus classicus "for osprey, mantel mew, tern, "Wildenten" of all types, sand piper, oyster catcher, avocet, grallator, "Ohrensteissruss," bustard, crane, sand martin, ruff, and many others." Northern guests also assemble at the Fischbach pond near Neustadt: Polar diver, North Sea diver, wild swan, osprey, fish hawk, kite, and even cormorant (according to Brueckner). The Hain, Steinach, and Roethen Valleys represent a structural line which can be followed further over the Slate Mountains. To be attributed to the appearance of numerous water and marsh birds is the distribution of select marsh, moor, and pond plants of the Neustadt plain.

The anthropogeographical structural lines: The spacious valleys of the Itz, Roethen, and Steinach, which lead to the mountains, have been natural immigration ways for plants and animals, as well as for people. Of course only a few settlements with the suffixes "-sha" and "-ehi" from the initial settlement period (up to the year 500) are present in the Schalkau-Sonneberg foreland: Steinach (Steinaha), Steudach, Weidach (Wiedehe). On the other hand, there is a more abundant representation of the Franconian settlements (the period 500-900), especially of the villages with the suffixes "bach" and "-dorf," which are most

strongly represented in the proximity of the Slavic boundary. The first Franconian stream of settlers, to which are attributed the village settlements with the suffix "-hausen," had advanced up to the Hildburghausen-Heldburg line. East of this line "-hausen" villages are rare. From the Main in the east, when the power and prestige of the Franconian kingdom had decreased, Slavs advanced into the valleys of the Itz, Roethen, Steinach, the Rodach of the Grabfeld, and apparently also into the uppermost Werra region. Perhaps to be regarded as Slavic settlements in Thuringia are the following: Muerschnitz (in 1317, Murzich, perhaps from the Czech "mrsnik" = knackery, according to Jacob); and Schierschnitz (in 1252, Schirssnitz from the Wendish "Sersenicy" = "sersen," according to Jacob). Under the strengthening Franconian kingdom, Frankish settlers now also advanced into the valley plains of the Itz, Roethen, and Steinach, but first they paused at the marsh and woodland of the Neustadt basin. There followed the founding of the villages with the suffixes "bach," "-dorf," "-berg," "-feld," "au." The villages with the suffix "-wind" originated in the ninth and tenth centuries; these were settlements of Wends under a Franconian manor lord: Gundelswind, Almerswind, Rueckerswind. The upper Itz region was preferred to the Neustadt plain. Since Erfurt possessed a commercial and political mark of precedence long before Leipzig, the old trade route led through the upper Itz region, from South Germany via Schalkau to Eisfeld, and further via the "Forest" to Erfurt. Another road, the Muehlberg road, led from Neustadt to Effelder, Forschengereuth, and over the Muehlberg to the Remnstieg. The Hohe Strasse ascended from the Linder plain up to Neufang and led over the Fellberg to Steinheid. Only with the coming into power of Leipzig was a new trade route through the Sonneberg basin

necessary, viz., the Juden road via Neustadt -- Koeppelsdorf -- Judenbach. Therewith, a stronger settlement of the sandy and marshy landscape was also induced. Thus, the villages whose names indicate marshes arose during that time: Horb (Old High German "horo" = marshy ground), Harbruecken (horo), Bruex, Rottmar (muor = swamp). Neustadt arose at a ford of the Roethen. In these times the ground was laid for the "Roten an der Sumb'g" ["Roten" on the Sonnenberg] under the protection of the castle on the Sonnenberg. In the fourteenth century the younger and the older parts of the town incorporated under the name Sonneberg. From Koeppelsdorf, a branch of the Leipzig road leads via Sonneberg -- Steinheid to Erfurt. On the old trade routes there have always been inducements for new industrial activity on the part of the nonpeasant segment of the population. The few peasant villages of the Neustadt plain: Unterlind, Heubisch, Mupperg, which are located on the fertile, old Holocene loam terrace (the "fat-basket" of the Meiningen upland). However, the agricultural yields are scarcely sufficient for two months for the inhabitants of the Kreis. It was principally the merchants of Leipzig who induced the establishment of the wood-cutting, toy, and doll industries. Today there are ship-carvers and carvers of toy horses, snakes, children's violins, etc., and doll-makers in almost all the villages between Schalkau, Sonneberg, and Neustadt, in the plateau villages, the marginal villages of the plateau, and in the settlements of the little-yielding sandy heaths of the plain. Sonneberg is the world-famous centrum of this lively industry.

The stimulation exerted by Nuremberg was also felt in the slate, pencil-slate, and whetstone industry of the "forest" in the Meiningen upland. Salzburg emigrants brought the marble industry to the Schalkau-Eisfeld district, where the platy Muschelkalk beds are suitable for the production of marble slabs in marble plants

(Eisfeld, Schalkau, Weissenbrunn, Fischbach, Schichtshoehn). The production of porcelain also found solid ground in the Sonneberg Kreis. The brisk industrial activity of the Meiningen upland made linkage to the railroad network necessary. The branch rail line Coburg-Sonneberg-Lauscha was enlarged into a transverse mountain rail line by being linked to the Wallendorf-Probstzella-Saalfeld line. Linkage to the North-South (Berlin-Munich) line made possible a line through the Kotliegende bituminous region to Stockheim. The marginal rail line Eisfeld-Schalkau-Sonneberg, along with the Kauenstein strip, facilitates above all the transport of the goods of the local industry to Sonneberg. Between Sonneberg and Coburg, the youngest rail line links the Steinach Valley and the Sonnefeld plateau.

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22. From Lichtenfels, via Banz and Vierzeñheiligen, to the
Staffelberg, to Staffelstein [see Note] (Two Days)

([Note:] Here also I am most grateful to the Lichtenfels geologist M. Abend for his willingness in once again undertaking a part of this excursion with me, whereby he pointed out remarkable geological exposures. I am also grateful to him for his granting to me of handwritten notes of personal observations in the Lias near Banz. (First edition.))

Goal: Excursion through the Upper Keuper and the entire Jura and Main terraces; Lichtenfels -- Koesten -- Banz castle -- Trimeusel -- Vierzeñheiligen -- Romannstal -- Staffelberg.

From the railroad station of Lichtenfels, through the town, and on the Coburg road. From the Main bridge, we orient ourselves on the Main region. From the Holocene Main plain rises an approximately 10-m-high Lower Pleistocene terrace, the course of which is indicated approximately by the railroad bed of the Main Valley. The oldest part of the town of Lichtenfels is located on this low-lying terrace. Here one of the first churches for the converted Slavs of the Radengau arose in the Carolingian period. The higher-lying part of the town rests on arkose. The heights south of the town, the Burgberg with an independent political community, consists of km 9, ko, and Lias α . It is bounded by two Hercynian-striking faults: the so-called Lichtenfels fault (von Guembel), which intersects the southeast egress of the town; and a parallel fault (established by Abend) which intersects the railroad-station grounds. Due to willow-rich, alluvial landscapes, there arose an important basket industry with Lichtenfels as the centrum to which the products of the cottage industries of the greater basket-making villages of the environs are delivered.

Rising in the southwest is the Staffelberg; in the northwest, the Herberg, which consists of Raet sandstone in its highest part. Nearby, east of the Coburg road, there is an outcropping of the low-lying terrace (I) with typical Main gravels. Dolomitic arkose (km 7) is exposed in the terrain between both roads: soft, coarse-grained, feldspat-bearing sandstone with lette and stone-marl beds, as well as carnelian segregations. In an intersecting road near a cave, castle sandstone with gravels (km 8) outcrops west of the Pleistocene loam trough of the Doerfler Brickkiln. We now descend via the old Coburg road to the Main bridge, take here the Banzer road past an exposure of alluvial Main gravel, and take near a road sign the Schoensreuth Kirchenweg which leads upward in a small valley. The small valley follows the afore-mentioned "Abend" fault and is thus tectonically representative. Fire-red zanclodont lettes are embedded beside arkose or castle sandstone. Now, on the only weakly ballasted second or intermediate road (Schmidtills), crosscountry in the direction of Koesten to a remarkable Raet sandstone quarry. Here, Dr. Rossbach of Lichtenfels discovered an old Paleolithic "Freilandstation": below a 20- to 30-cm-thick humus stratum he found flint implements -- a long leaf-shaped mallet, smaller hammers, points and scrapers, which belong to the cultural level of the Acheulean period. Now, back again to the Schoensreuth Kirchenweg, and down to the Schoensreuth mill on the Weiher Brook which deeply scoured the Raet sandstone. The Lichtenfels fault (cf. the profile of Banz in Figure 49) strikes through the opposite slope. Here, on the way, there is an outcropping above Raet-Liassic clays of Angulatus sandstone (L α), a sandy-calcareous conglomerate in which often to be found are shells of *Cardinia ovalis*. Near the turn-off point of the road specimens of Arien sandstone (L β): hard, rust-brown weathering

sandstone with many quartzite granules which, due to their hardness, are used in the construction of roads. The curved *Gryphaea arcuata* is very rare here. Further outcropping on the road are the nonfossiliferous Lias- β -clay (*Raricostatus* marl), and near a reservoir, the Lias- γ (*Numismalis*)-marl, which are rich in belemnite and conchylia. To the right on the way which leads down to the meadows of Weingarten, there is an outcropping of the *Costatus strata* of Lias δ , which, however, is especially well-exposed on the way which leads from the right Main bank up to the village of Weingarten. These are grey, golden-yellow weathering clay shale and marl with hard marly nodules (*Costatus* nodules) with *Ammonites (Amaltheus) costatus* (Lias δ). The damp marl and the deeply-entrenched little gorge with retrogressive erosion are covered by *Allium ursinum* mixed forests and shrubbery. Now, again down to the Main and along the path on the right bank to an extraordinarily good exposure in the *Posidonia* shale (Lias ϵ) (450 m from the Weingarten road). The terrace, which dips sharply toward the Main and upon which the small village of Weingarten is located, is conditioned by the very resistant *Posidonia* limestone. The cliff face is often divided by short but quite charming erosional ravines, the most beautiful of which are to be found there where the Main is more distant from the cliff face. The water works in retrogressive erosion over the *Posidonia* shale and limestone which outcrop like pages of a book. The charming scenery is enlivened by clematis-entwined ravine forest fragments. Now, past an earth fall which is in the initial stage of disengagement, to the Hausener Weg, and via this road up in the direction of Weingarten. There is again an outcropping of *Posidonia* shale ϵ and, thereabove, the *Jurensis* or *Radians* marl ζ which is here particularly rich in

belemnite (*Belemnites irregularis*): grey marl and marly limestone, and above them, the blue-black Opalinustone dα, which here near Banz manifests an extremely thick development. There where the oak woods (surrounded by gravel-adapted *Sarothamus scoparius*) begins, the Personatus sandstone dβ is embedded above Opalinustone. Ferruginous sandstone outcrops here near a cave in the intersecting way close below the castle.

We now visit the collection of petrifacts which is famous because of the Sauria finds. The beautiful castle arrangement is the work of the most famous Franconian baroque artist; the main building made of Banz Personatus sandstone is the work of Leonhard Dientzenhofer (1698-1701); the anterior wings are the work of Balthasar Neumann (1752); and the castle church (highly impressive from the viewpoint of interior decoration) is the work of Johann Dientzenhofer. The terrace before the castle church with the concave Moench choir represents a magnificent point from which one can enjoy the view of the landscape. At the same time, the view afforded is uncommonly informative geographically. Below us is the deciduous woods-covered Ornatus clay level; toward the northeast, close to the right Main bank, the Posidonia steep escarpment with Weingarten; the spacious valley with the meandering river; on the latter, Lichtenfels; located opposite us, the "echelon" mountain which is characteristic in its form (cf. sketch in Figure 50): the Staffelberg proper with the Adelundis chapel (540 m), Spitzberg (519 m), and Alter Staffelberg (526 m). Rising above the Opalinus clay is the Personatus or ferruginous sandstone echelon; embedded above the latter is the Werkkalk echelon; thereabove, the Tenuilobatus leveled-off area; over the latter, the Schwammkalk (*Pseudomutabilis*) and dolomite echelons. Above the ferrugineous-

sandstone echelon lies the pilgrimage place of Vierzeñneiligen in the middle of a green forest circle, and, in the next zone, Romennstal. The rail line runs about as far as the heights of the low-lying terrace which often projects over the Holocene formation as an escarpment 10 to 12 m high. Clearly recognizable in it is the gravel pit on the Reundorf-Grundfeld line. South of Grundfeld we again see a gravel plain in the second, or intermediate, terrace, 25 m over the water level of the Main. The third, or high-lying, terrace extends through the southern egress of Wolfsdorf; this terrace lies at an altitude of 50 m. From where we stand, the gravel pit within it is not visible. I would consider as post-basaltic the Tenuilobatus leveled-off area at an elevation of an average of from 450 to 480 m, whereas the two Staffelberge and the Spitzberg represent residual knobs from the pre-basaltic terrestrial surface, and their surfaces represent destructional forms of that terrestrial surface. Visible behind the Staffelberg are Gorkum, Kemnitzenstein, and Cordigast; to the right of the Staffelberg, the Veitsberg with the Veits chapel; on an upland ridge, the Altenburg castle near Bamberg; in the further distance, the Fichtelgebirge (Schneeberg and Ochsenkopf) and the Franconian Forest; before the latter, the striking mountains on the Kulmbach or Moenchsroeden fault: the Hassenberg, the coffin-shaped Plesten Spitzberg, the Stiefvater, and, in the background, the Mupperg in the Neustadt eolian depression.

From Banz, via the forest path, down to the third, or high-lying, terrace which lies 50 m above the level of the Main and which, near a chapel, slopes steeply 40 m to the Main, again belonging to the Posidonia level which here outcrops on the way from the inn along the Unnersdorf bridge. Here is the classical finding place of the first great Banz *Ichthyosaurus trigonodon*, which in

1842 was dug out from the famous Theodoris "Sauria stratum," which lies a bit under the main horizon marker of the Banz Lias formation, 28 to 29 m above the water level, viz, the limy marl stratum (VIII). It is thickly filled with *Monotis substriata* and is thus called *Monotis* plate. Now, along the river, from Unnersdorf to Nedensdorf. At the west egress of Unnersdorf, at an altitude of 25 m above the river, valley loess is superimposed on the Posidonia level. Shortly before Nedensdorf, up to the Mahlberg (329 m), the leveled-off area of which (with Main gravels and Dogger sandstones which lie about) indicates the fourth terrace (lower Deckenschotter) 75 m above the level of the Main. The trough north of this terrace doubtless represents an old Pleistocene, or still a Pleiocene, river valley in which, toward Nedensdorf, an erosion valley has been "gnawed out." On the right flank of this valley *Monotis* limestone outcrops. Now, to Trimeusel.

PROFILE ON THE TRIMEUSEL, as per L. Reuther

Hanging: *Variabilis*, *radians*, *jurensis*

Theodolite	m	Theodolite	m
48 honeycombed marl	4.0	35 marly slate	1.0
47 XII viscous, platy calcareous		34	
48 slate with grey belemnite	1.0	33 VI 3 stinkstone beds with	
45 XI uppermost stinkstone bed	0.09	32 V intermediate slate beds	0.32
44 marly shale	0.57	31 IV	
43 X thinning limestone	0.15	30	
42 foliated marl	1.0	29 foliated marl	0.20
41 XI thin limestone bed	0.04	28 III penetrating thin stink-	
41 foliated marl	0.60	stone bed	
vitriol slate	0.30	27 thin black-shale bed	0.30
39 VII upper <i>Monotis</i> limestone bed	0.20	26 II petering-out thin	
38 vitriol slate	0.17-0.20	stinkstone bed	
37 VII lower <i>Monotis</i> limestone bed	0.10	25 black shale	2.0
36a vitriol slate with 2 stink-		24 I Leibstein stratum	0.50
36b stone beds below	0.20	23 slate	0.30
		22 lying <i>Costatus</i> marl	-

(Drawn up by Dr. Lothar Reuther, Munich; published in Heune's monograph Die Ichtyosaurier [Ichthyosauria].)

[first part of sentence missing in original] close below Nedensdorf there is a good exposure of the Costatus and Posidonia levels (cf. the profile drawn up by L. Reuther). Rising vertically, close to the river here, this wall is an excellent example of lateral fluvial erosion in the region of Costatus marl and the subsequently-falling Posidonia slate and limestone. Now, via Nedensdorf and Unnersdorf, back to Hausen, past the rock slip (11 ha) shortly before the porcelain factory (this rock slip collapsed on a Sunday after Shrovetide 1921). Here, Personatus sandstone is founded on the slippery, mellowed substratum of Opalinus clay.

With the ferry over the river, and further to Reundorf and Grundfeld. Near the railroad crossing west of Grundfeld there is an exposure of the lower terrace in a gravel pit: approximately 3-m-thick ferruginous sand with pebbles of quartzite, lydite, clay slate, and greywacke; below, ferruginous sand, more or less cross-bedded, without pebbles or with only small ones. (In the middle of Schoenbrunn, barely 3 km distant, there is a rich drinking-water spring in the outcropping Posidonian slate.) A little to the south of Grundfeld the second, or intermediate, terrace, lying at an approximate altitude of 25 m, is exposed in two gravel pits. Almost exclusively, it contains rolled Malm limestone; rarely, Doggerstein. Now, to Vierzehnheiligen, which lies on the ferruginous sandstone echelon. Behind the architecturally-famous pilgrimage church there are abandoned iron mines in which a ferruginous sandstone vein was mined. Lying about are specimens and ferruginous geodes. From here, we ascend to the next echelon (Werkkalk echelon). Above a small pond, in the clay substratum which is here strongly overrolled by Malm limestone, a

ditch, in which is visible the higher Dogger levels, was dug. By looking around a bit, one can find *Humphriesianusoolithkalk* (perhaps still with *Ostrea*); the well-known *Ammonites macrocephalus* and *convolutus* of the *Macrocephalus* level; grey-green *Ornatulus* clay with the frequently-found characteristic fossil -- *Belemnites calloviensis*; and perhaps other pyritized ammonites. Here, the *Ornatulus* clay is covered by an *Allium ursinum*-beech forest. Back again to the church and, via the "Staeffelsweg," through the gravel-adapted *Myrtillus* mixed forest, to Wolfsdorf. At the south egress of the village, on the way to Romannstal, the third, or high-lying, terrace (50 m above the level of the Main) is exposed in an gravel pit. It manifests gravel similar to that of the second, or intermediate, terrace (gravel pits south of Grundfeld). Now, up to Romannstal in a nest area in the region of ferruginous sandstone. Thirty years ago a ferruginous sandstone vein was also mined here above the village. Near a reservoir there is an outcropping of *Sowerbykalksandstein*; this contains small brown oolitic grains. The *Humphriesianusoolithkalk* lies about in specimens. To the right of the way, a small bed of *Ornatulus* with a reed-grass fragment has slipped down, viz, on the secondary deposit. In the nearby wood pyritized ammonites have often been sought. These can still be gathered, as can *Belemnites calloviensis*. A lonely spruce on the way to the heights designates the limit between *Ornatulus* clay and *Malm α*, while the stand leads to the stone quarry in *Malm β*. *Malm α*: marly nodules, marly limestone with embedded glauconite grains and *Perisphinct*; thereabove, *Ammonites transversarius* and *altermans*. Then follows the white *Werkkalk*, also called the *Bimammatus* level after the characteristic fossil, *Ammonites bimammatus*. *Belemnites hastatus* also often occurs in the stone which is characterized by shell-like

fracture. The other Malm slopes are covered by *Seslerietum coerulesae*; the more shady slopes are covered by a deciduous or pine woods. Above the Werkkalk echelon lies *Tenuilobatus* marl which is extensively leveled. It is covered with peasants' fields and *Festuca ovina* drifts which rapidly regenerate into sedge-tree heaths in those places where they are subjected to human or animal influence. Now, to the Spitzberg which principally consists of *Tenuilobatus* marl and limestone; at the uppermost points, of schwammkalk only a few meters thick. Its slopes are covered with steppe-heath and pine-forest fragments. The schwammkalk is usually covered by a *Festucetum glaucae*.

The panorama afforded by the Spitzberg is glorious, and remarkable above all in the direction toward the Staffelberg. A 3-m-high wall (Gallic wall), today covered with hazel and hawthorn bushes, extends over the *Tenuilobatus* level area. This wall encircled the former oppidum celticum (*Menosgada*). The third echelon, above the *Tenuilobatus* level which continues behind the wall, is composed of schwammkalk and dolomite. This echelon is picturesquely crowned by a chapel and hermitage. Now, over to the Staffelberg. In the presence of good weather, we can enjoy a very informative view with the aid of the Rundsicht vom Staffelberg [Panorama from the Staffelberg] (Hans Driescher, Lichtenfels, h. O. Schulze Verlag), attempting to establish the great structural lines of the environs.

1. The Thuringian-Franconian Paleozoic: to the north, the Thuringian Forest with the porphyritic residual overthrust mountains of the Inselsberg and the Beerberg, the Eisfeld Bless which is constructed of Lower Silurian phyllite; to the northeast, the heights (Carboniferous slate) of the Franconian Forest; to the east, the granitic knobs of the Fichtelgebirge: Schneeberg and Ochsenkopf,

2. the depressed Triassic primary level: the Mupperg in the Neustadt-Sonneberg excavated area;
3. the Grabfeld Keuper trough in the northwest with Gleichbergen, Heldburg castle, and the Straufhain;
4. the Jurassic cuesta mountains in the southeast and south;
5. the basaltic Hochrhoen in the northwest: Wasserkuppe and Kreuzberg.

Geotectonic structural lines (see Figure 1 [of original]):

1. The great marginal fault which separates the Thuringian-Franconian Paleozoic from the Triassic foreland;
2. the Kulmbach-Moenchroedener-Wiedersbach fault, from the Plesten Spitzberg and its parallel fault up to the Grosser Dolmar;
3. the Lichtenfels or Gleichberg disturbance;
4. the Staffelstein-Hassberg disturbance.

The phytogeographical structural lines correspond to the geological:

1. Hercynian mountain flora;
2. the oceanic sandhill flora of the primary level;
3. the Franconian hill flora of the Muschelkalk and Gipskeuper (numerous Pontian and Mediterranean varieties);
4. the Franconian Alb flora of the Jurassic limestone (numerous Pontian and Mediterranean varieties).

The vegetation of the landscape of the Main consists of the following vegetal units: pastures and meadows on alluvial plains, arable fields, and deciduous mixed forests of the *Allium ursinum* type; oak-hornbeam forests in gravel-adapted facies on *Personatus*

sandstone, "Quellflur" stands and deciduous mixed forests of the *Allium ursinum* type on *Ornatus* soils. Fragments of steppe heaths cover these soils which are in turn overlain with Upper Jurassic debris. In the more northerly beds of the Werkkalk there is a light pine forest with Pontian and Mediterranean plants, of which *Melittis melissophyllum* characterizes the Alb facies. The *Tenuilobatus* marl is covered with peasants' fields and extended *Festuca ovina* drifts with often-stunted sloe scrubs. Steppe heath and heath woods decorate the steep, sunny rock formations and rubble heaps of the Werkkalk, schwammkalk, and Franconian dolomite. To be mentioned among the characteristic plant communities are *Seslerietum coeruleae* and *Festucetum glaucae*.

Structural lines of settlement: the Main region around Lichtenfels and Staffelstein is an ancient settlement region. A part of it is the former old Paleozoic settlement in the broad Franconian radius, the "Freilandstation" on the middle terrace (II) on the Herberg from the cultural level of the Acheulean (34000-18000 B. C.). Here, the Mesolithic, the transitional period from the Eolithic to the Neolithic, ushered in a flourishing microlithic culture: Koesten, Schoensreuth, and Stein near Lichtenfels (7000-5000 B. C.). There are indications of Neolithic settlements near the Schoensreuth mill and on the Staffelberg in the region of steppe heaths on the Jurassic limestone (4000-2000 B. C.). The Staffelberg was also continually settled in the following cultural periods: in the Bronze Age, the Hallstatt Period, and above all in the La Tene Period (1000-100 B. C.). This mountain forms the final link in the belt of Celtic peaked mountains -- the oppidum Menosgada, mentioned by the geographer Claudius Ptolemaeus in his Germania magna. Marcomanni were entrenched on the upper Main in the initial historical period and drove the Celtic boyars

out of Bohemia. These Marcomanni then took over the settlements of the latter. Herminones took possession of the settlements of the Marcomanni. Upon the defeat of the Thuringians, the Main region also came under Franconian rule. However, as early as in the Merovingian epoch (the defeat of Dagobert near Wogastisburg, 630), migrations of Slavic peoples toward the Main occurred. With the increase of the power of Franconia, the Slavic migrations came to an end, and, under Charlemagne, the Radenzgau (the Upper Franconia of today) became the eastern Franconian Gau earldom. In this period Banz became the settlement of a Franconian freeman over Slavic settlers. However, very shortly the secular rule was commuted for the rule of a Benedictine cloister which Christianized the Slavic Radenzgau. That of Lichtenfels was one of the first churches in the region. In 1803 the cloister was taken over by Banz, falling to the line of Bavarian Herzoge.

It is recommended that, either before or after the excursion, one view the prehistoric collection of Dr. Roszbach, dec, member of the Board of Health, in Lichtenfels.

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Figure 27. Erosion phases of the Nadeloechr near Themar. 1. Excavation phase. 2. Accumulation phase. 3. Eruption phase. 4. Present condition: artificial cut-off for railroad (E), road (St), and the Werra (W). Illustrations 1, 2, and 3 by Proescholdt; illustration 4 by the author.

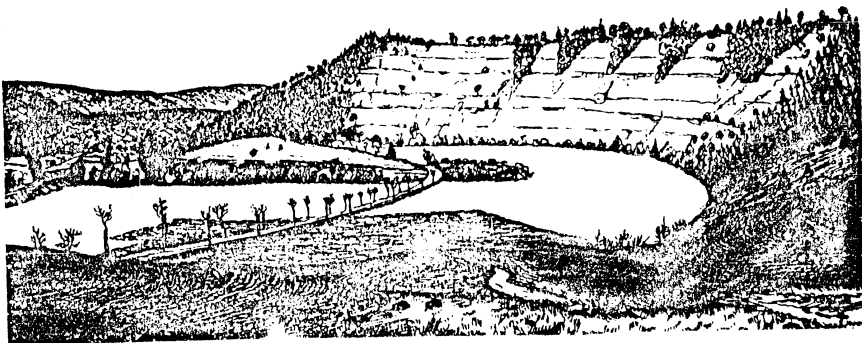


Figure 28. The Nadeloechr of the Werra near Themar. From: Kaiser, E., Landschaftsbiologie [Landscape Biology], 1937.
From a drawing by Mundt.

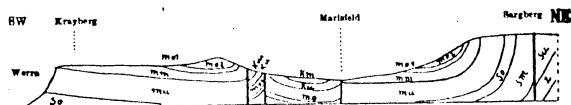


Figure 29. Krayberg, Marisfeld trough, Sargberg (1:65,000).

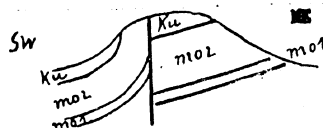


Figure 30. The Griesberg near Marisfeld.

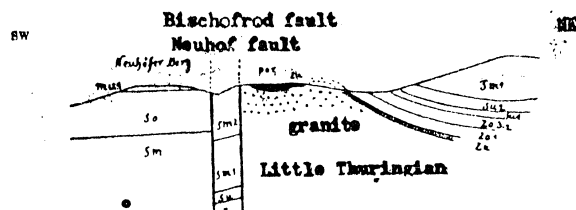


Figure 31. Little Thuringian Forest (1:142,000, per Tornow). A block of sm has become stranded between the Neuhofer Berg and the Little Thuringian Forest on faults. The Little Thuringian Forest, which is interrupted by the Bischofroed fault, manifests a marginal monocline.



Figure 32. The Schlangengrund near Ahlstaedt.

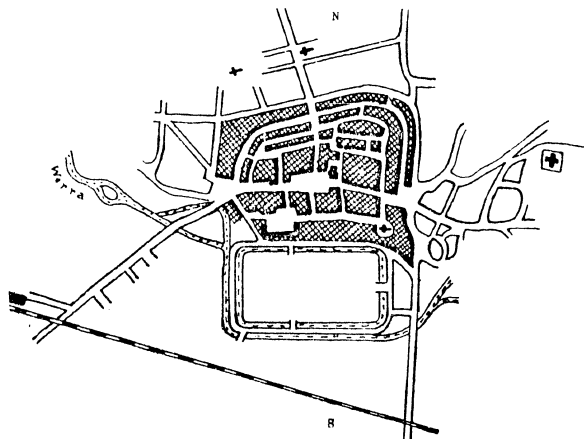


Figure 33. Town plan of Hildburghausen.

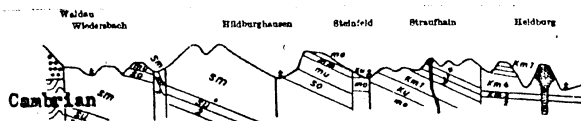


Figure 34. Profile of Waldau -- Heidelberg (1:300,000).

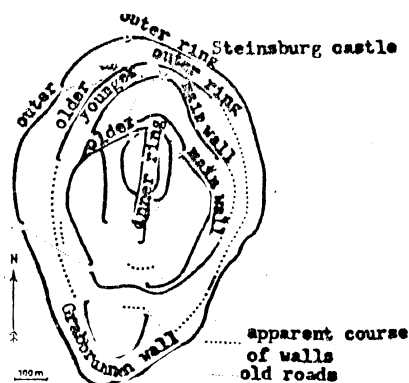


Figure 35. The lines of fortification of the Steinsburg castle (as per Goetze).

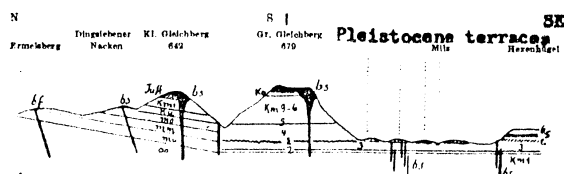


Figure 36. Geological profile of the Gleichberge and the Milz Valley (1:135,000) (greatly increased).

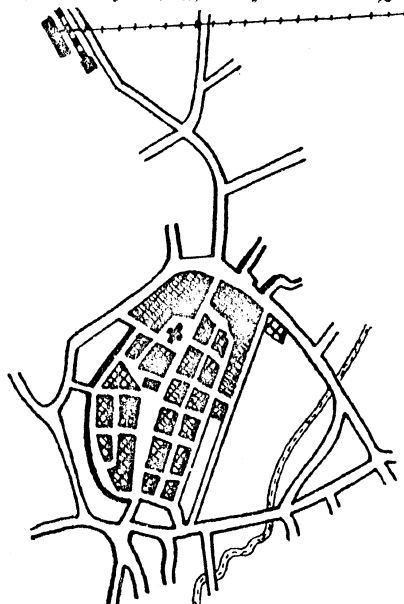


Figure 37. Town plan of Roemhild.

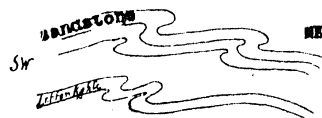


Figure 38. Folded löttenkohle strata near Bedheim.

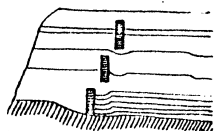


Figure 39. Basaltic dike near Gompertshausen.



Figure 40. Profile of Ursula-Franconian swell-Altenburg near Trappstadt (1:40,000) (greatly increased).

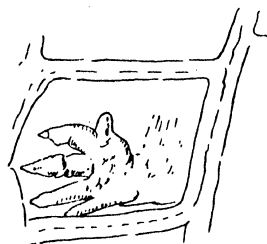


Figure 41. Chirotherium Earthi and relief impression of mud cracks.

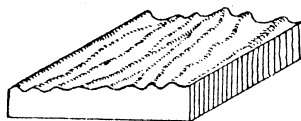


Figure 42. Sandstone plate, the upper surface of which is covered with gabled wave markings (ripples).

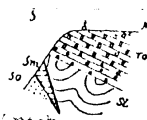


Figure 43. Irmelsberg near Gock.

81	Salurian	mn	Middle	Weissen
8m.	Middle Bun.	mo	Muschelkalk	main fault
8m.)	For Sandstone	J	Muschelkalk	Wiederbach
8m.)	Hellenkalk	S	Grasberg	fault
x	Schaukalk	O	Grasberg	fault

Keys:

B. Barfeld
 G. Gosau
 Gu. Gundoldwind
 H. Heid
 K. Kalzberg
 M. Mausendorf
 N. Neundorf
 S. Schaumburg

Legend:

t. Terebratulid limestone
 su. Lower Wealden
 50. Upper Bellerophon sandstone
 su. Lower Bellerophon sandstone
 Upper Muschelkalk

Key:
 B Barbfeld
 G: Goersdorf
 Gu. Gundelwind
 H Heid
 K Kalzberg
 M Mausendorf
 N Neundorf
 S Schaumburg
 St. Steudach
 Ste Stelzen

To Tossenthof
 T Truchenthal
 W Weitesfeld

t: Terebratulina
 limestone
 su: Lower Wollenkalk
 50: Upper Bunter
 shales
 su: Lower Bunter
 sandstone
 ms: Zechstein
 t: Upper
 Rottliegendes
 su: Lower
 Rottliegendes
 sb: Cambrium (day
 considered Si-
 lurian)
 HV: main fault
 GV: Goersdorf fault
 rail line Munich

Figure 45. Block diagram: upper Itz region (1:40,000).

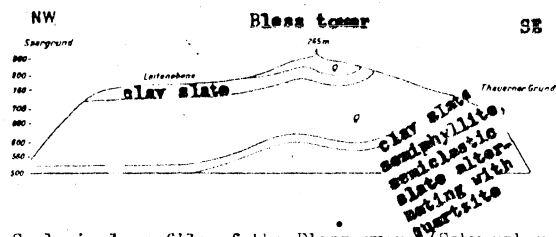


Figure 46. Geological profile of the Bless group (Schwarzburg saddle), showing the presumed course of the quartzite, clay slate, and semiphyllite. (1:25,000, elevation increased $2\frac{1}{2}$ times.) E. Kaiser.

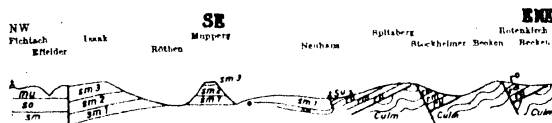


Figure 47. Geological profile of Fichtach-Mupperg-Spitzberg-Rotenkirchen. (1:160,000; height 1:40,000.)

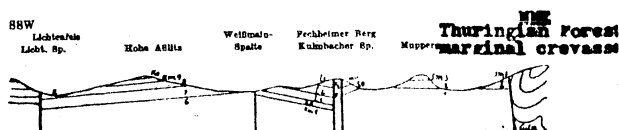


Figure 48. Geological profile of Lichtenfels-Fechheimer Berg-Mupperg-Thuringian Forest. (1:300,000; height 1:30,000.)



Figure 49. Profile of Trimeusel-Banz-Herberg. Drawn by E. Kaiser, as per H. Franke and M. Abend. (Greatly increased.)

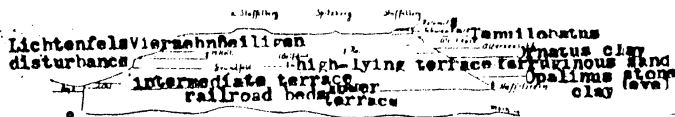


Figure 50. Sketch of the Staffelberg.

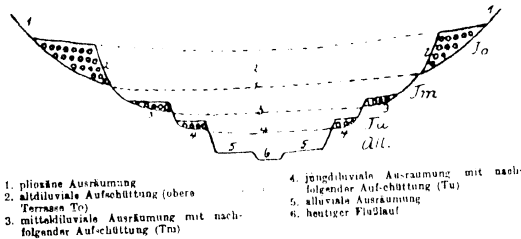


Figure 51. General terrace profile of the upper Werra Valley.

- 1, Pliocene excavation: 2, Old Pleistocene aggradation (upper terrace To): 3, Middle Pleistocene excavation (Tm): 4, Recent Pleistocene excavation with subsequent aggradation (Tu): 5, Holocene excavation: 6, River course of today.